THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
May 18, 1987 · Vol. XXI · No. 20 · $2/Copy · $44/Year

COMPUTERWORLD

INSIDE

Executive Report — The cobbler's children: Do vendor MIS shops use what their companies sell? **Page 59.**

In Depth — Interview: Alan Bignall of IDS/American Express. **Page 71.**

The Information Age Commission proposal expires amid political infighting of industry trade groups. Page 13.

Ansa Software offers multiuser version of Paradox data base. Page 19.

Early shipments of Macintosh II are spotty, while questions surface about hard-disk version and battery problems. Page 10.

Texas Instruments uses Intel 80386 for multiuser system running version of Xenix. Page 2.

National Advanced Systems plans to roll out four mid-range systems spanning gap between IBM's 4381 and 3090. Page 4.

West German distributor to buy out Calcomp's systems business. Page 118.

Computer Associates leaps to top of the independent software ranks with fourth-quarter revenue of $102 million. Page 95.

Sequent switches to Intel for processors in new minisupercomputer. Page 53.

Phoenix Technology CEO dissects technology inside IBM's PS/2. Page 35.

It's the worst of times for NCC

BY DAVID LUDLUM
and ALAN J. RYAN
CW STAFF

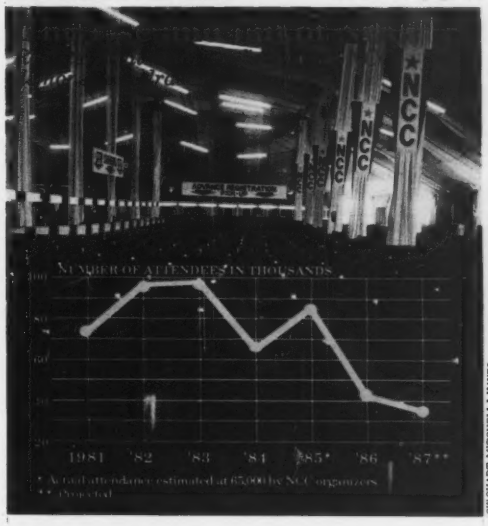
Faced with anemic preregistration and a cold shoulder from vendors, the National Computer Conference is headed for a new low this year. The decline of NCC — only four years ago the largest specialized trade show anywhere — stems in part from its own success and the recent economic climate, but more from ineffective marketing and a lack of response to industry changes.

Some who are close to the conference say a sufficiently weak draw this year could bring an end to the show. How has NCC fallen so far so fast? Interviews with dozens of past and present NCC officials, exhibitors, attendees and observers suggest an interplay of many factors, some of which were disregarded or mishandled by conference organizers.

Among those causes are the following:

- The frequently cited lack of focus on the part of NCC amid the rapid emergence of competing conferences targeting a specific vertical industry, computer function, type of product, vendor or geographical area.
- The overwhelming success of NCC in the early 1980s, which forced later shows to two cities with larger facilities, Chicago and Las Vegas. The latter site lacks a strong local market and raises objections from employers of some potential attendees.
- A computer industry slowdown and cost controls among user organizations, which hurt the conference business in general as vendors cut back on exhibitions and users reduced travel to trade shows.

Continued on page 116



CW CHART: MITCHELL J. HAYES

Microsoft licenses data base

Deal will port Sybase mini technology to PCs

BY DOUGLAS BARNEY
CW STAFF

REDMOND, Wash. — Microsoft Corp.'s long-awaited entry into the data base market will be made on the back of technology acquired from Sybase, Inc., *Computerworld* has learned.

A data base from Microsoft will touch off a fierce war with Lotus Development Corp. and Ashton-Tate, with all three battling for a share of the lucrative data base pie. The Microsoft product, however, will not be available until next year at the earliest, sources cautioned.

Microsoft, which has yet to release or announce a relational data base management system, intends to enter this market after the release of MS OS/2, an advanced microcomputer operating system from Microsoft expected early next year, sources said.

According to sources close to both firms, the licensing agreement allows Microsoft to use the transaction-oriented Sybase system as a back end or data base server. Microsoft is expected to market a PC-based front end developed in conjunction with Sybase. Sybase itself is developing a PC-based front end for its data

Continued on page 6

DEC peace offer angers MAP users

BY ROSEMARY HAMILTON
CW STAFF

PITTSBURGH — The strained relations between Digital Equipment Corp. and a group of users who back an emerging factory networking standard worsened last week when DEC officials attempted to heal the wound but ended up throwing salt on it instead.

This latest chapter in the continuing controversy over the Manufacturing Automation Protocol concerns an agreement between the computer vendor and MAP sponsor General Motors Corp. that was announced by DEC at last week's MAP/TOP User Group spring meeting here.

However, GM immediately challenged DEC's presentation, saying it inaccurately portrayed the agreement between the two companies.

Ironically, William Johnson, DEC's vice-president of distributed systems, said his keynote address was intended to clarify the issues surrounding DEC and MAP.

The agreement calls for GM and DEC to reopen a process to

Continued on page 6

Cobol 85 additions likely; revision process questioned

BY CHARLES BABCOCK
CW STAFF

A proposal to add mathematical functions to Cobol 85 appears to be moving toward final approval, but major business users remain skeptical of a standard-setting process that results in a periodically revised standard.

"This is just more bells and whistles, as far as I'm concerned. I don't see any make-or-break facilities," said Jordan S. Wouk, vice-president for quality assurance at the Bank of New York.

Cobol users will have until Aug. 10 to submit comments on the intrinsic functions, which would add a limited number of trigonometric and other financial and statistical functions to Cobol. The X3J4 Committee closed ranks in unanimously recommending what it calls an addendum to Cobol 85 after debating whether it was wise to initiate the revision process.

"There is a question whether these really belong in Cobol," said Lawrence K. Madison, director of data processing at Travelers Insurance Co. in Hartford, Conn.

Donald Schricker of Wang Laboratories, Inc., X3J4 chairman, said intrinsic functions would add the following:

- Trigonometric functions, such as sine, cosine and tangent.
- A function to convert a combined character-number string into a number.
- An annuity function that calculates an annual interest rate for a given investment over a specified period of time.

Continued on page 8

NEWSPAPER

5-DIGIT 48106 **********
C
CW00697O4-4
UNIVERSITY MICROFILMS
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

IN THIS ISSUE

Filling mid-range vacuum. NAS plans to bring high-end technology to the mid-range with U.S. debut of four models positioned against IBM 4381 and 3090 systems. Marketed now in Japan and Europe, the systems range in power from 5 to 17 MIPS and include the same technology as NAS high-end AS/XL 80s. Page 4.

NEWS

4 Sun, Stratus jointly develop network interface.

6 MAP movement slows as users wait for Version 3.0.

7 Symbolics chip contains all of Common LISP.

7 Wordperfect aims integrated program at corporate executives.

8 HP gives office automation users IBM mainframe access via Cullinet system.

8 Software maintenance staffs plead for better measures of their work.

10 Early shipments of Apple Mac II slow to a trickle.

12 American Hospital Supply to sell competitors access to purchasing system.

12 ICA show features communication rollouts, technical sessions.

13 Political infighting waylays creation of information age commission.

13 Microsoft backs off claims of Windows-OS/2 compatibility.

14 Zenith develops flat-screen PC color monitor.

14 Users of multivendor nets more apt to support generic standards, poll says.

18 Javelin takes aim at corporate market with financial modeling software.

19 Ansa introduces multiuser data base.

118 IBM superconductor announcements continue.

118 Calcomp sells CAD systems business to West German OEM.

SOFTWARE & SERVICES

25 Users, consultants divided on MAPICS.

25 Information Builders ships Focus integrated spreadsheet.

25 Software AG develops Ada, Adabas interface.

Is MIS one of the cobbler's children? Page 59.

MICROCOMPUTING

35 DEC reaches the end of the Rainbow.

35 Phoenix CEO discusses cloning Personal System/2.

35 Dayflo and its chairman undergo healthy turnaround.

NETWORKING

45 IBM exec relates network management plans.

45 Mac users get network software from 3Com.

45 Connectivity hindered by lack of PC standards implementation.

SYSTEMS & PERIPHERALS

53 Sequent boosts minisuper.

53 Qantel announces entry-level minicomputer.

53 Supercomputing conference attendees voice concerns.

Quotable

"The development team is put in a new building. The maintenance team is put in a warehouse. When the development team got new furniture, so did the maintenance team. It got the old furniture from the development team."

MEL A. COLTER
COLTER ENTERPRISES, INC.

See story page 8

MANAGEMENT

89 Cost-cutting prompts Sohio to centralize, integrate systems.

89 RJR Nabisco DP center seeks relational DBMS.

89 Data entry operators' health complaints top those of their clerical coworkers.

COMPUTER INDUSTRY

95 Computer Associates cracks $100 million quarterly revenue mark.

95 Wang's new VP ready to take on rocky road to restoration.

95 CBEMA drafts amendments to U.S. trade laws.

EMPLOYMENT TODAY

102 Vendor MIS managers perform under pressure.

EXECUTIVE REPORT

59 Do vendor MIS shops use their own equipment? By Michael Sullivan-Trainor.

IN DEPTH

71 IDS's Alan Bignall talks about a system architecture that won't quit.

81 Has MIS-to-end-user communication grown beyond the random phone call? By Alan Radding.

OPINION & ANALYSIS

21 Lecht makes sense of rising MIPS costs.

25 Matthews thinks strategically.

35 Zachmann thinks Multispeed is a tip-top laptop.

45 Fleig looks inside SAA concept.

53 Connolly says AIIM show attendees look, don't buy.

89 Mallach uses computers to gain competitive edge.

95 Wilder reviews scenarios of top executive change.

DEPARTMENTS

20 Editorial

94 Calendar

111 Buy Sell Swap

Multiuser 386 system fills TI workstation line

BY STANLEY GIBSON
CW STAFF

Filling out its multiuser workstation line, Texas Instruments, Inc. last week announced the System 1300, which is said to use Intel Corp.'s 80386 microprocessor and bring processing power of 4 million instructions per second (MIPS) to a maximum of 32 users.

Raymond Hartfield, TI's marketing manager, said that by swapping processor boards, users of the low-end Business-Pro System can upgrade to the System 1100, which can then be upgraded to the System 1300.

Moving up from the System 1300 to the next larger System 1500, however, requires a new CPU chassis, but all peripherals and terminals can be reused. The System 1500 can support some 125 users, according to TI.

'It's excellent'

"I think it's excellent. It's the product that many users were expecting IBM to announce in April," said John Logan, an industry analyst with The Yankee Group in Boston.

The System 1300, like the Business-Pro and the System 1100, uses the TI System V operating environment, which is based on Microsoft Corp.'s Xenix System V.

Hartfield also said the system can run Microsoft's MS-DOS so that a terminal user may run a PC program such as Lotus Development Corp.'s 1-2-3.

A wide variety of terminals, ranging from Digital Equipment Corp. VT100s to IBM Personal Computers, can attach to the system, Hartfield said.

The System 1300 features a 20-MHz 80386 chip with 16K bytes of cache memory. A standard 4M bytes of random-access memory is expandable in 1M byte increments to 16M bytes. An 80387 math coprocessor is optional.

Slated to be available in the fourth quarter this year, a standard configuration — with a floppy disk drive, a 182M-byte Winchester disk drive with a 60M-byte cartridge tape backup, 16 ports and a TI Model 924 terminal — is priced at $27,495, according to TI.

An upgrade kit to convert the System 1100 to a System 1300 costs $11,595.

Bomber stalks industry

Ten-year terror campaign target of FBI

BY RORY J. O'CONNOR
SPECIAL TO CW

OAKLAND, Calif. — An unidentified serial bomber who has already killed one man and injured 21 others may be targeting computer-related businesses and university departments, the Federal Bureau of Investigation said last week.

The agency is warning computer retailers and universities that the bomber may strike again soon, according to Bennett F. Cale, a special agent with the FBI's office here.

Since 1978, the bomber has either mailed or placed at least a dozen explosive devices in eight cities from Chicago to San Francisco, Cale said.

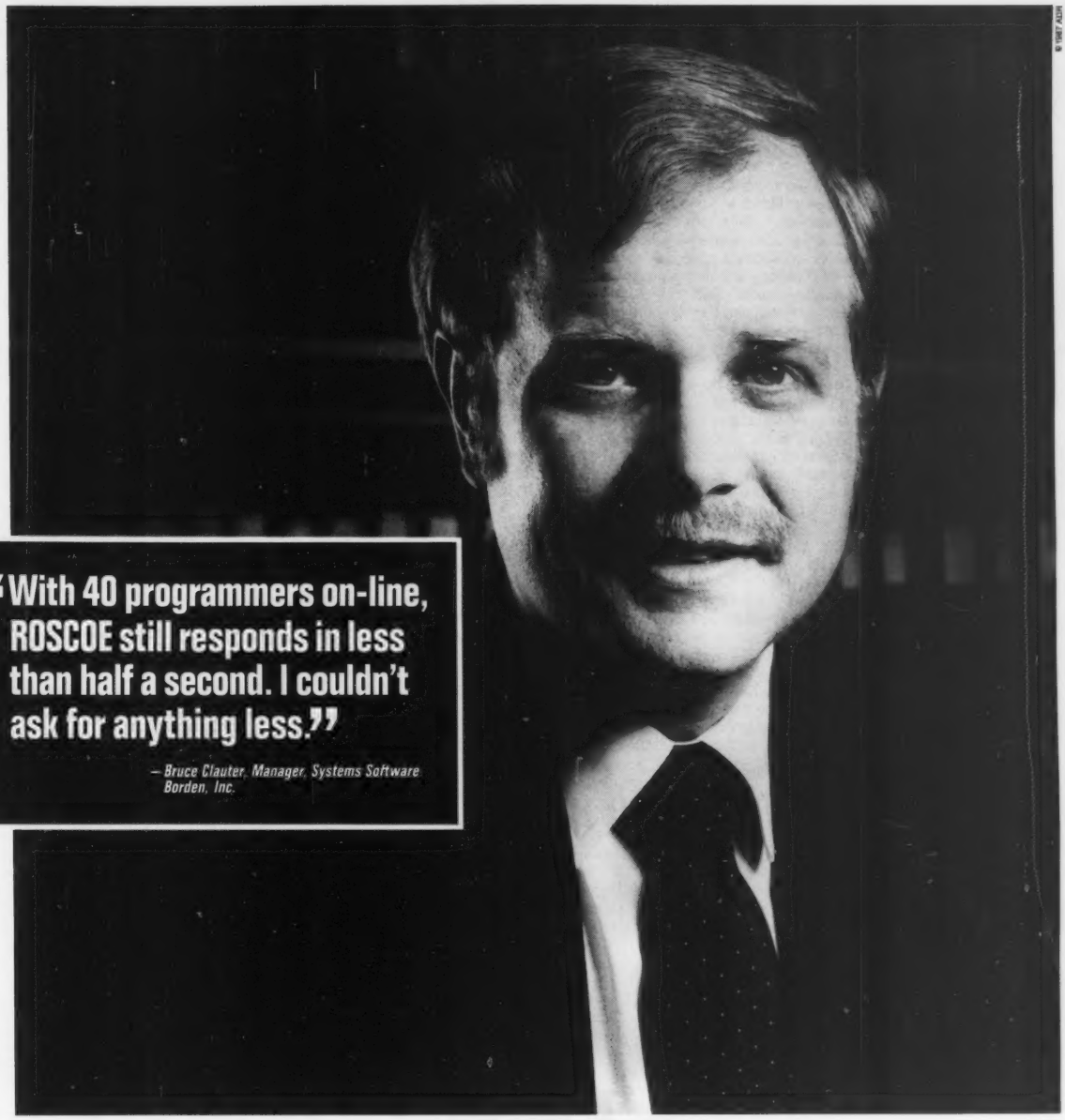
The most recent incidents included a bomb placed outside the rear entrance of Rentech Computer Rentals in Sacramento Dec. 11, 1985, which killed the store's owner. The last bombing linked to the man occurred Feb. 20 at Caam's, Inc., a Salt Lake City computer store, injuring one employee.

Cale said the materials and techniques used in making the bombs have led investigators to conclude they are the work of a single individual. A special task force called Unabom, composed of agents from the FBI, the Bureau of Alcohol, Tobacco and Firearms and U.S. Postal Service Inspectors, is offering a $60,000 reward for information leading to the arrest and conviction of the bomber.

Witnesses to the February bombing said they saw a man place something that resembled a board with protruding nails near the Caam's store, Cale said. They described him as a 25- to 30-year-old white man with a slender build, ruddy complexion, reddish-blond hair and a light moustache. He was further described as 5 feet 10 inches tall, weighing 160 pounds and was reportedly dressed in jeans, a gray-hooded sweatshirt and aviator-style sunglasses, Cale said.

Cale said computer-related businesses that receive unsolicited packages should first call the sender to determine if they are genuine. If they are not legitimate, recipients should call the police. Anyone with information about the bomber is asked to call the Unabom hot line, at (801) 359-1917, or a local FBI office.

O'Connor is a writer with *Infoworld*, an IDG Communications publication.


"With 40 programmers on-line, ROSCOE still responds in less than half a second. I couldn't ask for anything less."
– Bruce Clauter, Manager, Systems Software
Borden, Inc.

© 1987 ADR

When it comes to programming, time is indeed money. A lot of money. So the surest way to cut the cost of programming is to make it go faster.

That's why thousands of companies like Borden, Inc., the Iowa Power and Light Company and Giant Food Inc. use ADR/ROSCOE.®

Borden's programmers get more work done with ROSCOE because it gives them more time to work with the computer. Forty programmers can work at the same time and still get half second response times.

They speed up the programming process by using ROSCOE's high level procedural language to recreate typical program routines with a single command. And its screen painting facility to generate code automatically.

ROSCOE also helps Borden get more from their computers. Even with 40 programmers, ROSCOE's single address space architecture still uses less than 5% of their CPU. Which has helped them delay expensive hardware upgrades.

And ADR® can help you get the most from ROSCOE with our pre-installation consulting service, training programs and worldwide support network that solves most common problems over the phone.

To learn how ROSCOE can unlock the potential of your people and computers call 1-800-ADR-WARE.

ADR PERFORMANCE SOFTWARE.
Unlock the potential.

ADR
AN AMERITECH COMPANY

Applied Data Research, Inc. Orchard Road & Rt 206, CN-8, Princeton, NJ 08540 1-201-874-9000.

NAS eyes mid-range power gap

Four models in system will fill vacuum between IBM 4381 and 3090

BY JEAN S. BOZMAN
CW STAFF

National Advanced Systems Corp. (NAS) is planning to release four new mid-range models in the U.S. that would compete with IBM's 4381 and low-end 3090 systems, sources said last week.

The models, already introduced in Europe and Japan, would range in power from 5 million instructions per second (MIPS) to 17 MIPS, spanning a power gap between the 4381 and 3090 lines.

The move is intended to follow IBM's expected announcement of additional IBM 4381 models this week. The NAS computers, never sold in the U.S. before, should be announced in early June, according to sources close to the company, and shipped within 60 days.

The two NAS models introduced in Japan are the M 660 D, the smallest of the series, and the M 662 K, a top-of-the-line dyadic processor. These models bracket the NAS AS/VL uniprocessors, which were introduced in March at Cebit '87 in Hannover, West Germany. However, the systems will probably carry different names in the U.S. The new machines should supersede older NAS models sold here, including the AS/8000 machines, which are in the same power range.

Include same technology

All four NAS computers include the same technology now being shipped in the firm's high-end AS/XL 80, including the dynamic working storage capacity feature that is implemented in bipolar CMOS chips.

There are three uniprocessors, including systems based on the 660 D, the 7.5-MIPS AS/VL 50 and the AS/VL 60, which NAS West German spokesman said runs at more than 10 MIPS. At the high end of the series, there is a 17-MIPS dyadic version of the AS/VL 60 that is comparable to the 662 D.

Details about the U.S. pricing and NAS model numbers were not available, but the AS/VL 50 was priced in Germany at approximately $940,000. The purpose of the machines is to give would-be 4381 customers greater latitude in their decision making, Bernhard Scheer, Frankfurt branch manager for NAS's West German subsidiary, said in March.

The machines apparently will be priced in a way that will allow NAS to maintain what it claims is a 15% to 20% price/performance advantage against IBM. The base price of IBM's high-end 4381 Model 14 is $735,000, while the 3090 Model 150 is priced at $1.65 million.

'Gap products'

"These are our gap products," Scheer said. "They give the 4381 user who is near capacity options besides either installing a second 4381 or upgrading to an IBM 3090 Model 150." The 3090 Model 150 reportedly runs at 10.1 MIPS, while the 4381 Model 14 runs at 6 MIPS.

Both Japanese models support a maximum of 32 channels and have the option of six 6M byte/sec. channels. The M 660 D comes with up to 11 channels at 6M byte/sec., while the 662 K comes with up to 15 such channels, said Yasushi Sayama, deputy general manager of Hitachi America Ltd. in Tarrytown, N.Y. Main memory for the M 660 starts at 32M bytes and can be expanded to 256M bytes, while main memory capacity for the 662 starts at 64M bytes and is expandable to 256M bytes.

The Japanese models were announced on March 25, just weeks after the European AS/VL 50 and 60 were introduced in West Germany. But NAS announcements in the U.S. generally follow those made by Hitachi in Japan, Hitachi America's Sayama said.

The forthcoming NAS computers will bring the high-end XL technology down to the mid-range customer, according to Bob Djurdjevic, president of Annex Research, Inc. in Phoenix.

"These computers will strengthen their entire product line and give the NAS customers a nice growth path," he said, adding that the next processor beyond the four new ones would be the NAS XL/50, which he rates at 17.4 MIPS. Annex rates the XL/60 at 22½ MIPS, while the XL/80 is rated at 42 MIPS.

Stratus, Sun to weave net interface

BY NINAMARY BUBA MAGINNIS and ALAN ALPER
CW STAFF

NEW YORK — Stratus Computer, Inc. and Sun Microsystems, Inc. are expected to unveil plans this week to develop and market a network interface between Stratus XA2000 fault-tolerant computers and Sun workstations.

The two vendors will offer an interface for Sun's Network File Server (NFS) that will enable XA2000 systems to feed up-to-the-second ticker information to securities traders' Sun workstations, according to William Kelly, president of Security Trading Systems, a New York-based subsidiary of RMJ Securities.

The network interface should also allow securities traders to process customer transactions and funnel information back to the Stratus computers. The XA2000 is a series of high-volume on-line transaction processing machines that range in speed from 15 to 50 transactions per second.

Upgrade likely

To create the Stratus-Sun link, Stratus will most likely have to upgrade its proprietary Virtual Operating System, Kelly said. No target date for product availability has been set, according to sources close to Stratus.

Both Sun and Stratus refused to comment.

Although an announcement was not made last week at the Securities Industry Association Conference in New York, Stratus demonstrated the Sun workstation and XA2000 computer running an application devised by Security Trading Systems, Kelly said.

The securities firm has used Stratus computers since the early 1980s, and its traders operate Sun workstations for compute-intensive tasks, such as number crunching, that require a dedicated CPU to be effective, Kelly observed.

The Sun workstations run applications developed in-house that are tailored for the fixed-income securities market, Kelly said.

Performs market analysis

The exclusive applications perform market analysis on price levels, comparing active treasuries with off-the-run issues, and analyze mortgage-backed pool information on Fannie Mae accounts, pay-down speeds and prepayment assumptions, according to the securities firm president.

The RMJ subsidiary is already linking its Stratus and Sun hardware, Kelly said.

Stratus can communicate with Sun workstations today via CCITT X.25 and Ethernet, but Stratus officials at the securities trade show last week promised a better link would be available in the near future.

Kelly said he had spoken to both hardware vendors and told Stratus it lacked the much-needed ability to smoothly link with Sun workstations in the financial services arena.

Sun's offering of high-power workstations and NFS, a communications protocol that enables the workstations to talk to different vendors' computers, is

USING Sun's strong connection in the manufacturing and engineering world, Stratus hopes to gain market share in computer-aided manufacturing.

gaining prominence on Wall Street, according to the securities firm president.

Because Stratus has a strong presence in the securities trading arena, Sun plans to leverage its Stratus connection in that market in which its presence is relatively young, according to sources.

The Stratus-Sun agreement will also target the manufacturing market, according to sources.

Using Sun's strong connection in the manufacturing and engineering world, Stratus hopes to gain market share in computer-aided manufacturing, an area in which its fault-tolerant machines would perform as shop floor controllers.

Design engineers would transmit product plans to Stratus machines on the shop floor, where manufacturing personnel could review, comment and relay feedback to engineers via the NFS interface, sources said.

Third-party agreements

Sun did announce third-party financial services software agreements at last week's securities industry show.

Additions include Fame, a package for investment research and analysis, economic forecasting, bank market analysis and asset and liability management. The application is supplied by Fame Software Corp., a subsidiary of Citicorp.

Sun also announced an agreement with The Athena Group and will offer the software house's Portfolio Management Advisor and Foreign Exchange Advisory System.

QV Consulting Services, Inc. now runs its Real-Time Portfolio Management System on Sun hardware, and Cogensys Corp. has ported its Automobile Lending Package to the workstation vendor's product line.

Speakeasy Computing Corp. inked an agreement with Sun to offer Speakeasy, an interactive package that analyzes financial, economic and scientific research data.

COMPUTERWORLD

Editor in Chief
Bill Laberis
Executive Editor
Paul Gillin

News Director
Peter Bartolik
Senior Editors
James Connolly, Systems
Clinton Wilder, Industry
Elisabeth Horwitt, Networking
Charles Babcock, Software
David Ludlum, Management
Douglas Barney, Microcomputing
Patricia Keefe, Networking
Ed Scannell, Microcomputing
Senior Writers
Donna Raimondi, Rosemary Hamilton
Stanley Gibson, David Bright
Ninamary Buba Maginnis
Staff Writer
Alan J. Ryan
New Products Editor
Suzanne Weixel

Features Director
George Harrar
Senior Editors
Janet Fiderio
Glenn Rifkin
Joanne Kelleher
Associate Editors
Amy Sommerfeld Fiore
Deborah Fickling, Penny Janzen
Assistant Editor
Kelly Shea
Senior Writer
Michael L. Sullivan-Trainor
Researcher
Sally Cusack

Managing Editor
Donovan White
Chief Copy Editor
Patricia Heal Erickson
Assistant Chief Copy Editor
Steven M. Ulfelder
Copy Editors
David W. Bromley, Mary Grover
Martha E. Ruch, Sharon Baker
Laura O'Connell, Marie T. Burke
James Daly

Design Editor
Marjorie Magowan
Graphics Editor
Mitchell J. Hayes
Graphic Designer
P. Charles Ladouceur

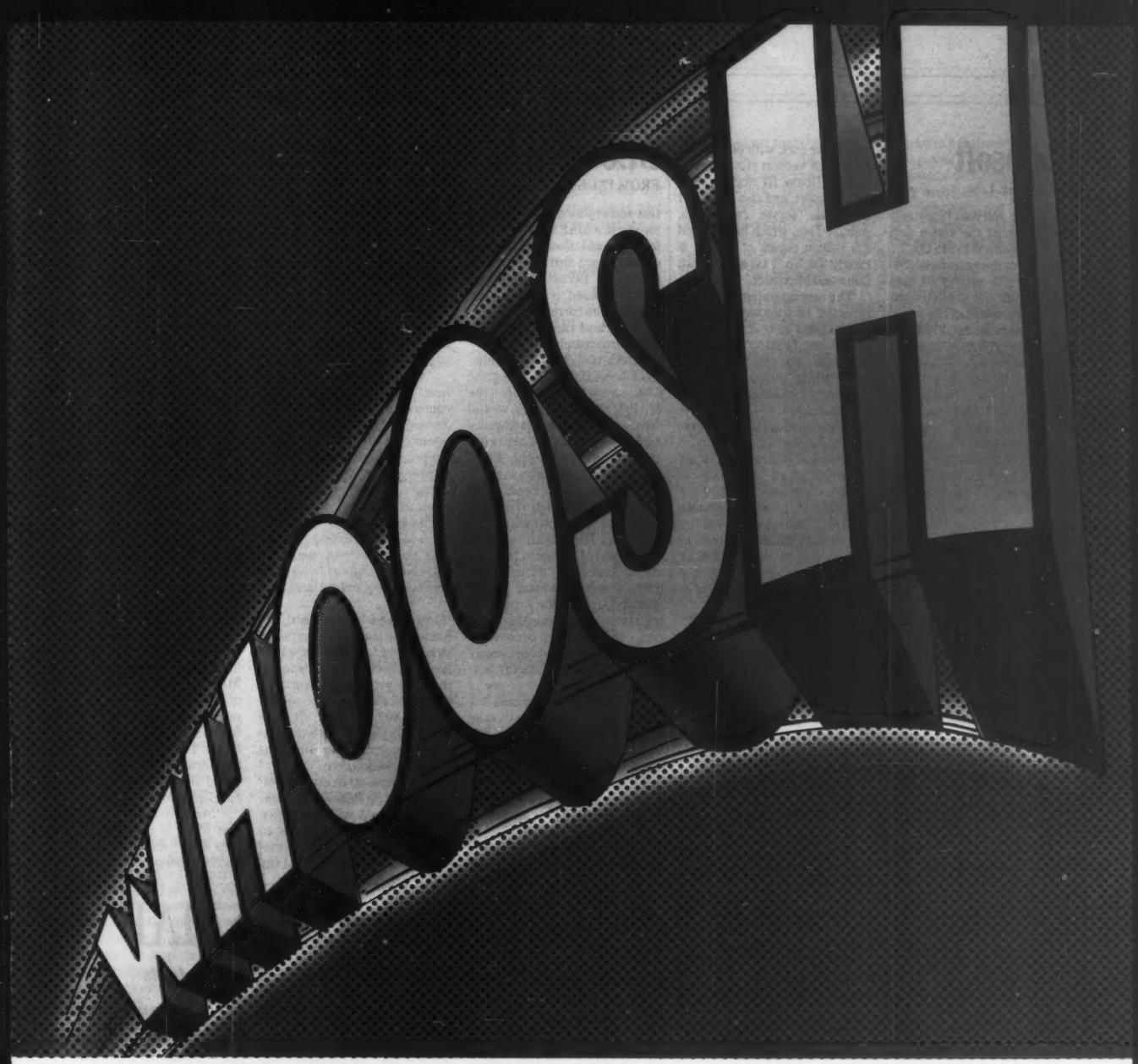
Assistant to the Editor in Chief
Parth Domke
Editorial Assistants
Patricia Faherty, Christie Sears
Linda Gorgone, Bonnie MacKeil
Rights and Permissions Manager
Nancy Shannon

News Bureaus
Mid-Atlantic
201/967-1350
Alan Alper, Correspondent
Washington, D.C.
202/347-6718
Mitch Betts, Correspondent
West Coast
415/328-8064
Jeffry Beeler, Chief
James A. Martin, Correspondent
Midwest
312/827-4433
Jean S. Bozman, Correspondent

IDG News Service
Susan Blakeney, Director

Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171
617/879-0700

Computerworld is a publication of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 80 computer publications in more than 28 major countries. Fourteen million people read one or more IDG Communications publications each month. IDG Communications publications contribute to the IDG News Service offering the latest on domestic and international computer news. IDG Communications publications include: ARGENTINA'S *Computerworld Argentina, PC Mundo*; ASIA'S *Communications World, Computerworld Hong Kong, Computerworld Indonesia, Computerworld Malaysia, Computerworld Singapore, Computerworld Southeast Asia, PC Review*; AUSTRALIA'S *Computerworld Australia, Communications World, Australian PC World, Australian Macworld*; AUSTRIA'S *Computerwelt Oesterreich*; BRAZIL'S *DataNews, PC Mundo, Micro Mundo*; CHILE'S *Informatica, Computacion Personal*; DENMARK'S *Computerworld Danmark, PC World Danmark*; FINLAND'S *Mikro, Tietoviikko*; FRANCE'S *Le Monde Informatique, Distributique, InfoPC, Le Monde Des Telecoms*; GREECE'S *Micro and Computer Age*; HUNGARY'S *Computerworld SZT, Mikrovilag*; INDIA'S *Dataquest*; ISRAEL'S *People & Computers Weekly, People & Computers Biweekly*; ITALY'S *Computerworld Italia*; JAPAN'S *Computerworld Japan*; MEXICO'S *Computerworld Mexico*; THE NETHERLANDS' *Computerworld Netherlands, PC World Benelux*; NEW ZEALAND'S *Computerworld New Zealand*; NORWAY'S *Computerworld Norge, PC World Norge*; PEOPLE'S REPUBLIC OF CHINA'S *China Computerworld, China Computerworld Monthly*; SAUDI ARABIA'S *Arabian Computer News*; SOUTH KOREA'S *Computerworld Korea, PC World Korea*; SPAIN'S *Computerworld Espana, Commodore World, PC World Espana, Communicaciones World, Informatica Industria*; SWEDEN'S *ComputerSweden, Mikrodatorn, Svenska PC World*; SWITZERLAND'S *Computerwelt Schweiz*; UNITED KINGDOM'S *Computer News, DEC Today, ICL Today, PC Business World*; UNITED STATE'S *Amiga World, Boston ComputerNews, CD-ROM Review, Computerworld, Computers In Science, Digital News, Federal Computer Week, 80 Micro, FOCUS Publications, InCider, Infoworld, Macworld, Computer + Software News (Micro Marketworld/Lebhar-Friedman), Network World, PC World, Portable Computer Review, Publish! PC Resource, Run*; VENEZUELA'S *Computerworld Venezuela*; WEST GERMANY'S *Computerwoche, PC Welt, Run, Information Management, PC Woche.*



THIS GIVES YOU A ROUGH IDEA OF HOW FAST SYNCSORT OS DOES ITS SORTING.

It's only a rough idea, granted.

But then, how do we convey the speed of SyncSort OS? A sort so fast it results in dramatic reductions in the use of your MVS or MVS XA computer resources? (Meaning CPU Time, EXCPs, disk work space and the like.)

Then, to compound matters, how do we tell you that we have features to make any programmer more productive?

And that our service is almost as fast as our sorts? (Over 85% of all problems are cleared up within 24 hours.)

There's really only one way for you to get an idea of how good SyncSort OS is: try it yourself. To arrange for a test on your system, call us at **201-930-9700.**

We'll whoosh right over.

syncsort

THE BEST OF SORTS.™

© 1987 Syncsort Incorporated, 50 Tice Boulevard, Woodcliff Lake, NJ 07675.

Microsoft

FROM PAGE 1

base server and also reportedly intends to port the entire data base package itself to MS OS/2.

As part of the agreement, Sybase is free to market its data base and front end to its customers. Further details of the firms' relationship were not available, however, as both were unwilling to comment.

While the Sybase package currently runs on Digital Equipment Corp. VAX minicomputers and Sun Microsystems, Inc. machines, it is unclear whether the agreement will allow Microsoft to sell data base software for architectures other than IBM Personal Computers and compatibles.

Both users and analysts said they are impressed with the Sybase product. "Sybase has the most state-of-the-art data base management system on the VAX and Sun. If Microsoft has a plan to move that to the PC, they will have an extremely competitive product and should be able to capture a very large share of the market," said Richard Finkelstein, vice-president of the Codd & Date Consulting Group's central region.

The Sybase product is based on a version of SQL and is designed for heavy transaction processing as well as decision-support applications. The product uses a requester/server architecture under which applications are kept separate from the data. Users can access the data through character-based terminals or bit-mapped workstations. Sybase is reportedly working to provide data access to IBM PCs as well.

The Sybase agreement will give Microsoft a leg up in the next-generation data base and data base server market. Lotus is taking an approach similar to Microsoft's with Lotus/DBMS, which uses an SQL-based data base engine with local-area network (LAN) capabilities licensed from Gupta Technologies, Inc. in Menlo Park, Calif. Lotus is developing its own front ends to work with the Gupta engine. The Lotus product will not be available until next year.

Ashton-Tate is also expected to join the fray, with plans to offer a LAN version of its market-leading Dbase III that includes SQL support, and also may offer data base server capabilities. Ashton-Tate, which has shipped 1.5 million copies of Dbase, is clearly the No. 1 target for both Lotus and Microsoft.

The new operating system is expected to fragment the data base market as it shifts from a stand-alone desktop orientation to a data base server approach under which multiple personal computers can access a common data base.

A data base will also fill a gaping hole in Microsoft's family of applications. Microsoft already has a solid word processing offering — Microsoft Word — for both IBM PCs and Apple Computer, Inc. Macintoshes. And the firm intends to battle Lotus in the PC integrated spreadsheet market with PC Excel, expected later this year.

Analysts said they believe that an aggressive applications strategy will help Microsoft maintain its recently gained No. 1 position in microcomputer software revenue.

Sybase beta-test users last week said the product has much promise. "I like the architecture; a server separate from the front end. That way, the data is independent of the application," said Paul Trotter, manager of automation for the banking and corporate finance group of Chemical Bank. "With a really good front end like Ansa Software's Paradox to market with Microsoft, they would have an incredible market," Trotter said.

For Peter Kuzmak, senior systems project leader at Johns Hopkins Hospital in Baltimore, the most important issue is porting Sybase to machines from Pyramid Technology Corp.

Under an OEM agreement with Pyramid, the product is being reworked to offer increased performance. Sybase also has an OEM agreement with Stratus Computer, Inc. In addition, the firm is working on a port to IBM mainframes.

Sybase did reveal the shipping last week of its first products. Both are SQL-based data base tools that run under VMS on DEC VAX minicomputers and Unix on Sun workstations.

Data base and file management

Microcomputer software market through retail channel

Ashton-Tate: 34% unit share, 62% dollar share
Software Publishing Corp.: 18% unit share, 7% dollar share
Blyth Software, Inc.: 2% unit share, 2% dollar share
Ansa Software: 3% unit share, 5% dollar share
Microrim: 3% unit share, 5% dollar share
IBM: 9% unit share, 4% dollar share
Microsoft Corp.: 4% unit share, 2% dollar share

INFORMATION PROVIDED BY IMS AMERICA LTD.'S MONTHLY SURVEY OF INVOICES FROM 500 COMPUTER SPECIALTY STORES

DEC offer

FROM PAGE 1

test and evaluate physical media for use in a MAP network. In effect, it would allow DEC to present evidence that Ethernet, on which its Decnet networking system is based, is a viable alternative to the current MAP-specified physical media, the IEEE 802.4 broadband cable.

Users took issue with Johnson's presentation, claiming the DEC executive implied that the MAP/TOP User Group was in favor of adopting other physical media specifications. They maintain that 802.4 is the only physical media they support.

Ethernet is at the heart of the controversy between DEC and the users that began two months ago when DEC Chairman Ken Olsen riled MAP users by making a number of public statements that implied there was no need for a new factory networking standard. Raising the question, "Why another network?," Olsen said he believed Ethernet was sufficient for the factory environment.

Last week, DEC officials set out to clarify Olsen's position at this gathering of MAP users. But when DEC's Johnson brought the news of the DEC/GM agreement, he included what GM claimed were "erroneous statements," further irritating users.

The agreement was rolled in with five other points that Johnson said were "statements being jointly issued by DEC and GM." One of those statements concerned DEC's belief that a "greater choice of physical- and data-link technologies would strengthen the MAP program."

Michael Kaminski, GM's MAP project manager, claimed that by using the DEC and GM joint statements heading for all six points, Johnson implied that DEC and GM were in agreement on all six points, which was not the case.

"I want to clarify our position," Kaminski said at a press conference that followed the keynote speech. "GM still believes that 802.4 technology is the proper media for the factory environment. We have not changed. We did not select 802.4 arbitrarily. DEC indicated this morning that new data on Ethernet was available, and the process should be reopened. The only thing we agreed to was that process to test and evaluate."

'No change in position'

Kaminski's statements were bolsterd by Charles Gardner of Eastman Kodak Co., chairman of the users group's steering committee. In discussing the preference for 802.4, he said, "It is not only GM's position. It is the sustained position. No one has changed position here."

In a follow-up interview, Kaminski said he believes the new testing process will only prove again that 802.4 is superior to Ethernet in most factory environments. "We won before. I say let's do it again," he said.

On hand after the press conference, Donald Jenkins, manager of DEC's computer-integrated manufacturing product marketing and planning, said his company asserts that Ethernet has matured and has been enhanced significantly since the users group adopted 802.4 in the early 1980s. As a result, it should be considered as a "viable option" to 802.4

In addition to the Ethernet vs. 802.4 issue, other statements by Johnson appeared to confuse and irritate users. He suggested that the users group has taken on a "wide range of computing issues, such as network management, image processing and directory services, which are outside the MAP/TOP User Group's primary expertise."

In response to that statement, Kaminski offered a curt response: "That is patently untrue."

Johnson also presented information — similar to Olsen's earlier remarks — that is perceived as contradictory. On the one hand, he suggested that the MAP specifications are not fully in line with the Open Systems Interconnect (OSI) model of the International Standards Organization. Then, he said DEC is fully committed to OSI. But Johnson added that DEC is aggresively developing MAP products.

"I want to make it very clear that MAP is certainly in sync with OSI," Eastman's Gardner said in response.

A slowdown on road to MAP

Lull forecast until June '88 introduction of MAP 3.0 products

BY ROSEMARY HAMILTON
CW STAFF

PITTSBURGH — The Manufacturing Automation Protocol (MAP) movement has sputtered to a slow crawl recently and is not expected to pick up significant speed for another year, when products based on the new version of 3.0 of the networking specifications are released.

"We've reached a plateau," said James Doar of Boeing Computer Services at the MAP/TOP Users Group meeting held here last week. Doar is chairman of the MAP Executive Committee.

The lull has been caused by a number of factors. For one thing, the current status of MAP is typical of many new concepts or technologies — the initial frenzied attention it received has been toned down to a more moderate level.

Users and vendors alike said they expect a new swell of support for MAP in June 1988, when the users group will host the Enterprise Networking Event, billed as the first public demonstration of MAP 3.0 tools.

But compounding the current MAP lull is the wait for the 3.0 version, the specifications of which were just released this month. MAP 3.0 products are not expected until late 1988, and many users have opted to wait for them.

Still other observers have suggested that the recent Digital Equipment Corp. controversy has also caused users to hold off from taking the MAP plunge. "Clearly, the controversy in the last few months has kept the pause going for longer than we'd like," said Joseph Schoendorf, president and chief executive officer of Industrial Networking, Inc.

Michael Kaminski, General Motors Corp.'s MAP project manager, agreed. "I think there's more going on than meets the eye, but it isn't as much as we'd like to see," he said.

The Tennessee Eastman Co., a chemicals and plastics division of Eastman Kodak Co., is one site that is going ahead with MAP. According to Carl Terrell, a senior engineering associate, his firm is "thinking of installing a pilot in late 1987 or 1988." The company would go with the MAP 2.1 network because the migration to 3.0 is becoming more clearly defined, he claimed.

"Back in January, you could sense a lot more hesitation on the user's part," Terrell said. "But now, the vendors are starting to outline their strategies of how migration will be possible. Now I feel like, why wait for 3.0 when 2.1 gives you some functionality?"

A user at a Martin Marietta Corp. facility said he is not sure whether his division will go with MAP 3.0 or 2.1. As a result, the migration issue, as well as the year-long wait for 3.0 products, "doesn't really apply to us," said Glen Sanders, senior group engineer of optical communications.

Sanders' division recently purchased Industrial Networking equipment to launch a MAP test program with computers from six different vendors. He said he expects MAP 2.1 "to work right for our purposes now, and when 3.0 becomes available, we may go to that."

Symbolics to produce, sell LISP chip

BY STANLEY GIBSON
CW STAFF

CAMBRIDGE, Mass. — Symbolics, Inc. will announce tomorrow a microprocessor containing all of Common LISP, a language used in artificial intelligence applications, a source close to the company said.

The expected announcement follows the February introduction of a LISP chip by Texas Instruments, Inc.

Symbolics will use the chip in its own machines but, in a departure from past practices, the company is also prepared to sell it to other parties. The chip will not be produced until the second half of 1988, the source indicated.

Larger wordlength

Harvey Newquist, an artificial intelligence consultant based in Scottsdale, Ariz., concurred with the report that the new microprocessor will run current Symbolics applications and will have a 40-bit wordlength, a change from Symbolics' current 36-bit wordlength.

"The 40-bit addressing requires a little bit of compiling, but it's not that big a deal," Newquist said.

With some 400,000 transistors, the chip will reportedly provide up to five times the processing power now available on Symbolics microprocessors.

A major difference between the Symbolics and TI chips is that the Symbolics chip contains microcode and the TI chip does not.

In addition, the Symbolics chip is said to contain all of Common LISP, while the TI chip does not.

Portables get writing program

BY ED SCANNELL
CW STAFF

OREM, Utah — Wordperfect Corp. next month will introduce an integrated PC software program centered around its Wordperfect word processing program that is tailored to work on portable computers and aimed at corporate executives, the company said.

Called Wordperfect Executive, the program reportedly contains a scaled-down version of Wordperfect and a data base and spreadsheet that are also smaller versions of other company products. The programs exchange information through the same integrating shell used in the company's Library program.

While the program does not have a built-in communications program to transfer information from a portable to a desktop system, users can load their own programs through the shell "in just a few minutes," a company spokesman said.

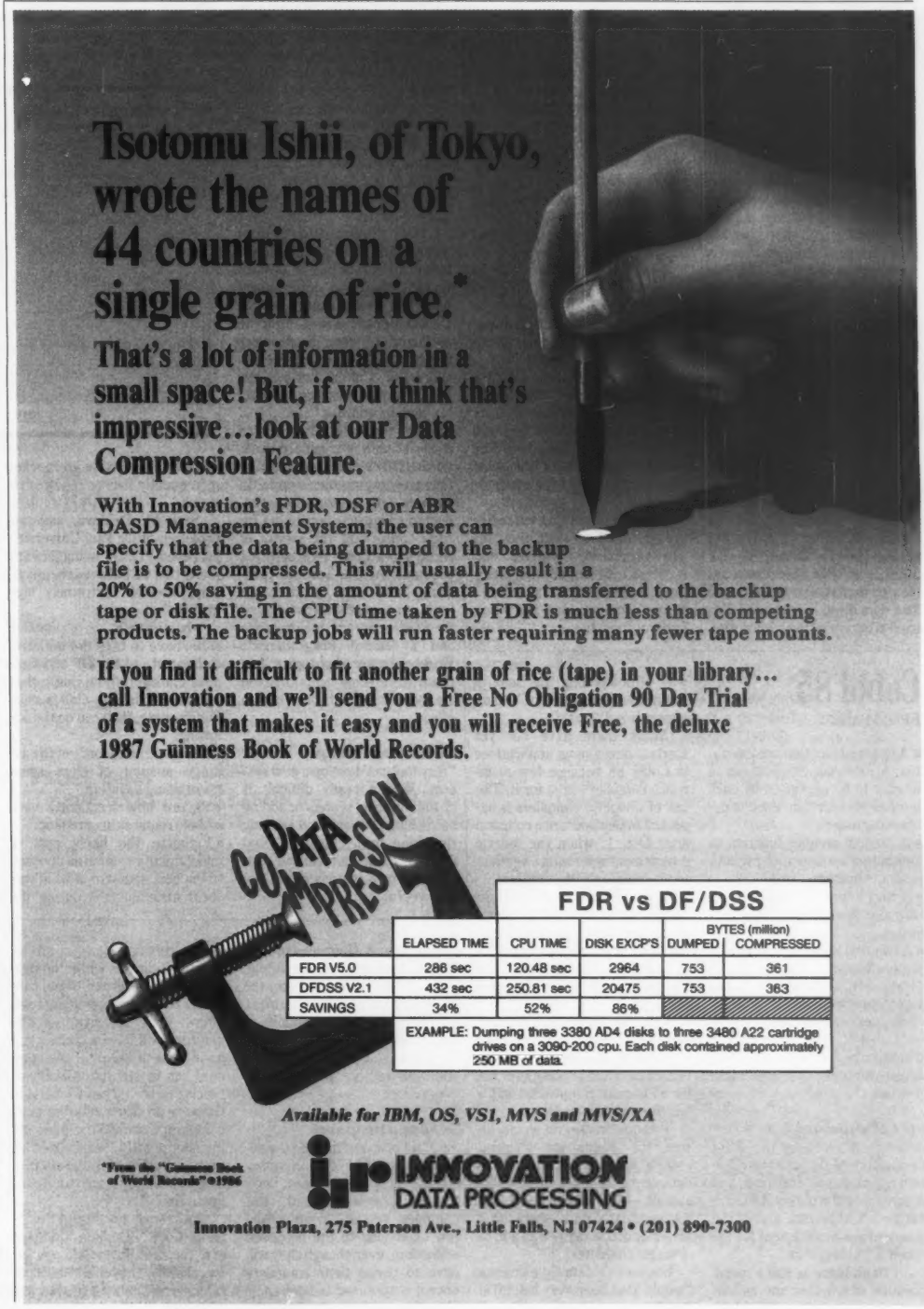
"A lot of companies have told us they standardized on Wordperfect for their secretaries but wanted something easier, faster and sleeker for their executives. Something more like a sports car than a Cadillac," said Pete Peterson, Wordperfect's executive vice-president. "We feel the typical executive is not a great typist, so we tried in every way to save keystrokes."

Wordperfect Executive has been said it has priced the program at $249 and the firm said it will be generally available by June 1.

Wordperfect Executive comes on a single disk and can be loaded into a system with 640K-byte system, of memory, the vendor said.

The advantage for portable computer users is that the software has to access the disk fewer times, which prolongs the battery life in portable systems, Peterson noted.

The program reportedly is compatible with popular-selling portable systems using Microsoft Corp.'s MS-DOS.


Tsotomu Ishii, of Tokyo, wrote the names of 44 countries on a single grain of rice.*
That's a lot of information in a small space! But, if you think that's impressive...look at our Data Compression Feature.
With Innovation's FDR, DSF or ABR DASD Management System, the user can specify that the data being dumped to the backup file is to be compressed. This will usually result in a 20% to 50% saving in the amount of data being transferred to the backup tape or disk file. The CPU time taken by FDR is much less than competing products. The backup jobs will run faster requiring many fewer tape mounts.
If you find it difficult to fit another grain of rice (tape) in your library... call Innovation and we'll send you a Free No Obligation 90 Day Trial of a system that makes it easy and you will receive Free, the deluxe 1987 Guinness Book of World Records.
DATA COMPRESSION
FDR vs DF/DSS
ELAPSED TIME
CPU TIME
DISK EXCP'S
BYTES (million)
DUMPED
COMPRESSED
FDR V5.0 286 sec 120.48 sec 2964 753 361
DFDSS V2.1 432 sec 250.81 sec 20475 753 363
SAVINGS 34% 52% 86%
EXAMPLE: Dumping three 3380 AD4 disks to three 3480 A22 cartridge drives on a 3090-200 cpu. Each disk contained approximately 250 MB of data.
Available for IBM, OS, VS1, MVS and MVS/XA
*From the "Guinness Book of World Records" ©1986
INNOVATION DATA PROCESSING
Innovation Plaza, 275 Paterson Ave., Little Falls, NJ 07424 • (201) 890-7300

HP taps Cullinet ICMS for IBM data base link

BY ELISABETH HORWITT
CW STAFF

PALO ALTO, Calif. — Following a two-year software development effort, Hewlett-Packard Co. has become the fifth major computer vendor to provide its office automation users with access to IBM mainframe data bases through Cullinet Software, Inc.'s Information Center Management System (ICMS).

Information Access Cullinet Link, announced by HP last week, integrates ICMS's mainframe data base access system with HP's Information Access, an existing software product that provides a consistent query interface for specific IBM Personal Computer and HP 3000 data base systems.

The link with ICMS extends Information Access to provide a "single window to view different data bases on a personal computer, HP 3000 minicomputer or IBM mainframe," noted HP product line manager Royce Murphy.

Server-request software running on an IBM Personal Computer and HP minicomputer provides a consistent set of commands by which users can access files on either the HP 3000 or an IBM host, download files or records to the PC and load data directly into a PC data base program such as Microrim, Inc.'s Rbase 5000 or Ashton-Tate's Dbase II, to a Lotus Development Corp. 1-2-3 spreadsheet or to a word processing document, HP claimed.

Conversion automatic

Information is automatically converted to the correct format. PC users can also upload files and update host data bases via the Information Access Cullinet Link — a feature that is not available from other office automation host vendors' ICMS links, according to Murphy.

"You can access data from, say, Rbase, upload it to an IBM mainframe file and update a data base from that file," he said.

Information Access Cullinet Link prices range from $9,500 for the HP Micro 3000 to $29,500 for the HP 3000 Series 70. First deliveries are scheduled for late summer.

HP's Information Access software with a 10-user license ranges in price from $5,900 for the HP Micro 3000 to $18,400 for the HP 3000 Series 70. The enhanced version of the software is scheduled to be available on June 1.

Other vendors that currently provide links between their office automation systems and ICMS include Digital Equipment Corp., Data General Corp., Prime Computer, Inc. and Wang Laboratories, Inc.

Staffers seek bolstered image

BY CHARLES BABCOCK
CW STAFF

TORONTO — Software maintenance staffs need better measures of their work to show their business managers their function is critical to the competitive stance of the company, said software maintenance experts convening here last week.

The annual meeting of the Software Maintenance Association drew 270 people to this Canadian city, where one of the chief topics was how to improve the image of the maintenance programmer. Software maintenance, as one speaker put it, is a white-collar job saddled with a blue-collar name.

"The development team is put in a new building. The maintenance team is put in a warehouse. When the development team got new furniture, so did the maintenance team. It got the old furniture from the development team," observed Mel A. Colter of Colter Enterprises, Inc. in Monument, Colo., during his keynote address.

The Software Maintenance Association was organized to advocate the elevation of the maintenance programmer's craft. In January, the association conducted a vigorous debate in Chicago concerning the merits of three major Cobol restructuring products. At the Toronto gathering, additional maintenance tools, an expert system devoted to PL/I program maintenance and a federal Programmer's Workbench were hot topics. And there were some signs that the ego-boosting efforts have had an effect.

Difficult to change

"Any fool can develop a new system. What's really difficult is changing an old system or adding something to it and still keeping the thing from crashing," said Marilyn Blake, a technical analyst at Crown Life Insurance Co. in Toronto.

Highlighting the maintenance task for upper management has always been a problem. The maintenance programmer cannot deliver a new system with a flourish or count the number of lines of new code produced when much of his task is coping with old code.

In addition, data processing directors tend to make an unrealistic assessment of the code under their jurisdiction, even when it frequently fails or requires revision.

Sasa M. Dekleva, assistant professor at De Paul University, surveyed 112 DP managers and found that 98 believed their software was of "extremely high quality."

Maintenance programming staffs have to take the initiative to illustrate to the DP and business managers how much they are accomplishing, Colter said. For example, they can do the following:

- Keep careful records of the average amount of time spent maintaining a system.
- Record how frequently each system requires maintenance.
- Estimate the likely cost of maintaining a system as opposed to the best estimate of what was spent maintaining it during the previous year.

"We make proposals that are not strongly supported from a business, cost-benefit perspective," Colter noted.

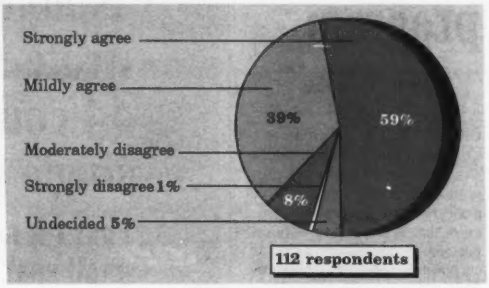
Once measures have been established for routine work, the maintenance staff should start thinking strategically and try to extend the life of an existing system, improve an existing system rather than merely keeping it running and build fault tolerance into an aging unit so that a single logic error will not bring the whole system down.

If maintenance staffs can do these things and "tell management that [they] have made the resulting savings available for discretionary, competitive spending," they will have improved their standing within the company, Colter said.

"We must move on to higher levels of challenge," he advised the group.

At the same time, managers must recognize competence in maintenance programmers the same way they would in a development staff. "The saddest thing to see is people making a difference, but no one has the means to measure that difference. It's a way to demotivate people," he said.

Software maintenance
The software you maintain is of extremely high quality



INFORMATION PROVIDED BY DE PAUL UNIVERSITY
CW CHART

Cobol 85

FROM PAGE 1

- A factorial function used in statistical formulas, which allows an integer to be multiplied by each number smaller than itself in descending order.
- A random-number function to generate a sequence of pseudo-random numbers.
- A maximum function that determines the largest value in a series.
- A function to convert letters to either all upper or lower case.

Madison said the public review process will indicate whether business users want the existing Cobol 85 to be stabilized or whether they want functionality added through the addendum process.

Part of standard

Addenda adopted by the X3J4 Committee of the American National Standards Institute and approved by the parent X3 Committee would become part of the standard prior to the next full revision of the language.

"I think there is still a major question of whether the addendum process isn't a backdoor way of postponing the issue of the next major revision," Madison said.

Many users have not yet started developing applications in Cobol 85 because few mainframe compilers exist for it. The use of Cobol 85 compilers is expected to become more common after Oct. 1, when the federal government will require vendors to provide Cobol 85 compilers.

Users shifting to a Cobol 85 compiler will find that their applications written in earlier versions of Cobol, such as Cobol 74 or Cobol 68, will have to be reworked to run under the new compiler.

With that large task in mind, some MIS representatives have questioned whether the benefit of an addendum process is offset by additional complexity and a heavier maintenance burden.

To sidestep the complexity issue, the committee stripped away a proposal to add Boolean data elements — or bit-level 1s and 0s — to Cobol. Currently, the smallest field element on a screen must be defined as a byte or single character.

Boolean data elements "would have been very helpful in developing system utilities," said Jerome B. Garfunkel of Garfunkel Associates in Litchfield, Conn., an X3J4 Committee member and Cobol 85 authority.

"The business community is better served by not having bit-level data in Cobol," said Madison, who is also a member of the committee.

Dropped proposal

An X3J4 proposal making the additions optional for compiler writers has been dropped, committee spokesmen said. But compiler vendors have raised few objections to the proposed addendum, even though they will have to revise their compilers once it is approved to keep their U.S. General Services Administration certification.

"Some of the larger companies are concerned that contracts based on providing compilers that conform to the standard will have a certain ambiguity about them" if the standard can be revised, said Bruce Sinclair of Ryan-McFarland Corp., a producer of a personal computer Cobol 85 compiler and member of X3J4. Sinclair said his firm supported the revision process, as did spokesmen for Micro Focus, Inc.

Spokesmen for Digital Equipment Corp., Tandem Computers, Inc. and Prime Computer, Inc. also said they would incorporate addenda as soon as they are approved.

Although many Cobol users already have access to the mathematical functions provided by the initial addendum, they must call those functions through assembler or other routines.

Cobol's existing mathematical capabilities are considered much more limited than those of other languages, such as Fortran.

Interested parties may obtain a copy of the addendum by sending $30 to Global Engineering Documents in Santa Ana, Calif. Comments may be submitted to Computer and Business Equipment Manufacturers Association, Attn: Catherine A. Kachurik, Suite 500, 311 First St. N.W., Washington, D.C. 02001.

GET HALF-A-COMPUTER FREE WITH ORACLE VERSION 5

With ORACLE version 5, you save half the computer you thought you needed in order to "go relational"... some benchmarks indicate you save even more.

WHY IS VERSION 5 OF ORACLE SO FAST ON MAINFRAMES, ON MINIS AND ON MICROS?

□ REASON #1: AI OPTIMIZES QUERY PROCESSING.

V5 applies artificial intelligence to SQL query optimization. For example, few DBMSs can optimize the query "Select accounts 90-days overdue **and** accounts over $10,000." But only ORACLE can optimize "Select accounts 90-days overdue **or** accounts over $10,000."

□ REASON #2: ARRAY PROCESSING OPTIMIZES ACCESS TO LARGE SETS OF DATA.

Relational DBMSs have always dealt with **logical** sets of data. But they manipulated only one **physical** record at a time. V5 eliminates overhead by physically delivering arrays of hundreds, even thousands, of records at a time.

□ REASON #3: PARALLEL-PROCESSING OPTIMIZES COMPUTER RESOURCE USAGE.

V5 is 100% re-entrant shared code, and ORACLE's parallel-processing architecture fully exploits modern dyadic and quadratic processors from IBM, and other multi-processing computers such as those from DEC and Stratus. So ORACLE uses all the MIPS in parallel-processor configurations.

□ REASON #4: MULTI-TABLE CLUSTERING OPTIMIZES JOINS.

ORACLE stores data from different tables on the same physical disk page. This technique—called *multi-table clustering*—permits you to access data from multiple tables in one disk read operation. Clustering improves ORACLE performance on all multi-table operations, such as join queries, update transactions, etc.

□ REASON #5: HIGH-SPEED RELATIONAL SORT FACILITY OPTIMIZES DATA AGGREGATION

Ad hoc relational queries frequently request that data be grouped, ordered or otherwise sorted. V5's internal sort facility performs aggregation and elimination early, faster than previously thought possible.

□ REASON #6: EFFICIENT ROW-LEVEL LOCKING OPTIMIZES TRANSACTION THRUPUT.

Row-level locking and a read-consistency model optimizes ORACLE V5 transaction concurrency. For the first time, high transaction thruput is achieved by a fully relational DBMS.

THE ULTIMATE REASON

Oracle introduced the first relational DBMS and the first implementation of SQL back in 1979. Today ORACLE is installed on thousands of minis and mainframes, and over ten-thousand PCs. ORACLE is the only SQL-*compatible* relational DBMS that's *portable* across IBM mainframes, DEC, DG, HP and most other vendors' minis and micros, including the IBM PC. And ORACLE applications and databases are *connectable* across different hardware and operating system, providing you with a true distributed solution to your information needs.

Spend half a day at an Oracle seminar in your city, and find out how you can have the benefits of a portable, DB2-compatible relational DBMS... and save half a computer. Call our national seminar coordinator at 1-800-345-DBMS. Or write **Oracle** Corporation, Dept. V5, 20 Davis Drive, Belmont, CA 94002.

U.S. SEMINARS

AK Anchorage ... Apr 14
AL Birmingham ... May 12
AR Little Rock ... May 12
AZ Phoenix ... Apr 15, Jun 3
Tucson ... Jun 30
CA Concord ... Jun 10
Los Angeles ... Apr 7, May 12, Jun 16
Newport Beach ... May 5
Pleasanton ... Apr 8
Sacramento ... May 5
San Diego ... May 14
San Francisco ... Apr 9, May 7, Jun 16
San Jose ... Apr 30, Jun 18
CO Colorado Springs ... Apr 21
Denver ... Apr 16, May 5, Jun 25
CT Hartford (Farm.) ... May 5
DE Wilmington ... May 5
FL Tampa ... Apr 8
GA Atlanta ... May 6
IA Des Moines ... Apr 15, Jun 17
ID Boise ... Jun 4
IL Chicago ... Apr 9, May 14, Jun 11
Springfield ... May 7
IN Indianapolis ... Apr 22, May 20, Jun 25
KS Wichita ... Apr 2
KY Louisville ... Apr 8
LA New Orleans ... Apr 15, Jun 26
MA Boston ... Apr 15, May 14, Jun 10
Springfield ... Apr 9
MD Baltimore ... Apr 2, Jun 24
Bethesda ... Apr 7, Apr 15, Apr 21, May 5, May 13, May 19, Jun 4, Jun 10, Jun 18
ME Portland ... Apr 22
MI Detroit ... Apr 7, May 12, Jun 9
Grand Rapids ... Apr 9
MN Minneapolis ... Apr 23, May 13, Jun 30
MO Kansas City ... Apr 9, Jun 9
St. Louis ... Apr 14, May 12, Jun 16
NE Omaha ... Jun 2
NJ Iselin ... Apr 1, Apr 15, Apr 29, May 13, May 19, Jun 11, Jun 25
NM Albuquerque ... Apr 30
NV Las Vegas ... Apr 1
NY Albany ... Apr 23, Jun 17
Buffalo ... Apr 8
New York City ... Apr 8, Apr 16, Apr 22, May 6, May 14, May 21, Jun 16, Jun 24
Rochester ... Apr 16, May 14, Jun 11
OH Cincinnati ... Apr 22, Jun 17
Cleveland ... Apr 1, May 5, Jun 2
Columbus ... Apr 2, May 6, Jun 3
Dayton ... Apr 21, Jun 16
OK Oklahoma City ... Apr 7, May 29
Tulsa ... Jun 16
OR Portland ... May 7
PA Allentown ... Apr 21
Harrisburg ... May 6, Jun 17
King of Prussia ... Apr 23
Philadelphia ... Apr 9, May 7, Jun 11
Trevose ... Jun 30
SC Columbia ... Apr 7
TN Nashville ... Apr 9
TX Amarillo ... Apr 7
Austin ... Apr 1, Jun 11
Dallas/Ft. Worth ... Apr 14, May 5, Jun 9
Houston ... Apr 9, May 7
San Antonio ... Apr 2, Jun 10
UT Salt Lake City ... Apr 29, Jun 18
VT Burlington ... May 6
WA Seattle ... Apr 7, May 12, Jun 24
WI Madison ... Jun 23
Milwaukee ... Apr 29, Jun 9
WV Charleston ... Apr 15

CANADIAN SEMINARS

Calgary ... May 19
Edmonton ... Apr 14
Hamilton ... Apr 21, May 19, Jun 16
London ... Apr 28, May 26
Ottawa ... Apr 2, May 7, Jun 4
Regina ... Jun 16
Saskatoon ... Jun 9
Toronto ... Apr 7, May 12, Jun 9
Vancouver ... May 14
Victoria ... Apr 21
Winnipeg ... May 5

ORACLE®

COMPATIBILITY • PORTABILITY • CONNECTABILITY

Ottawa (613) 238-2381 □ Quebec (514) 337-0755 □ Toronto (416) 362-3275
ORACLE-U.K. (SURREY) 44-1-948-6976 □ ORACLE-EUROPE (NAARDEN, THE NETHERLANDS) 31-2159-49344

Call (800) 345-DBMS today.

©1986 by Oracle Corporation. ORACLE® is a registered trademark of Oracle Corporation. SQL/DS, DB2 and IBM are registered trademarks of IBM. DEC, DG, AT&T, Stratus, HP and Bell Laboratories own numerous registered trademarks. TRBA.

Mac II deliveries, questions trouble dealers

BY PATRICIA KEEFE
CW STAFF

Initial shipments of the Apple Computer, Inc. Macintosh II began two weeks ago but are limited to the single-floppy disk drive, monochrome version that is expected to have limited appeal.

When the product was announced in March, Apple said it would ship the color monitor in the second quarter. Apple now says shipment of the color monitor has been delayed until later this summer. It also said it would ship the hard-disk configuration this month, but reports have surfaced about disk crashes and controller problems in the laboratories at Apple and at third-party software developers.

In addition, some early users have grumbled about problems with the Mac II's battery.

The 32-bit "open" Mac II is considered the key to Apple's entry into the desktop business market and its defense against the new IBM personal computers.

Initial Mac II shipments are supposed to be split between dealers, universities and large corporate accounts. But it appears that distribution may be spotty for a while.

No Apple resellers contacted last week had received Mac IIs, and most said they doubt they will receive any units before the end of the month. "They [Apple] keep changing their story," complained one Apple dealer, adding that although the unit is supposed to be available in limited quantities, Apple direct sales are already out in some of his accounts with the new machine.

Another dealer, who is trying to get a demonstration machine to show to corporate accounts, expressed concern that Apple could miss the boat if it delays shipping in volume. "Corporate America has a choice. Apple's got their foot in the door now. But if the Mac II [in volume] comes simultaneously with the second wave of IBM Personal Systems/2s, then IBM will be a full block ahead, and Apple will look like the boy who cried wolf," he said.

At the moment, Apple is only selling to universities, hoping to sell to students before the end of summer, according to Michael Murphy, a San Fransisco-based analyst and editor of the "California Technology Stock Letter."

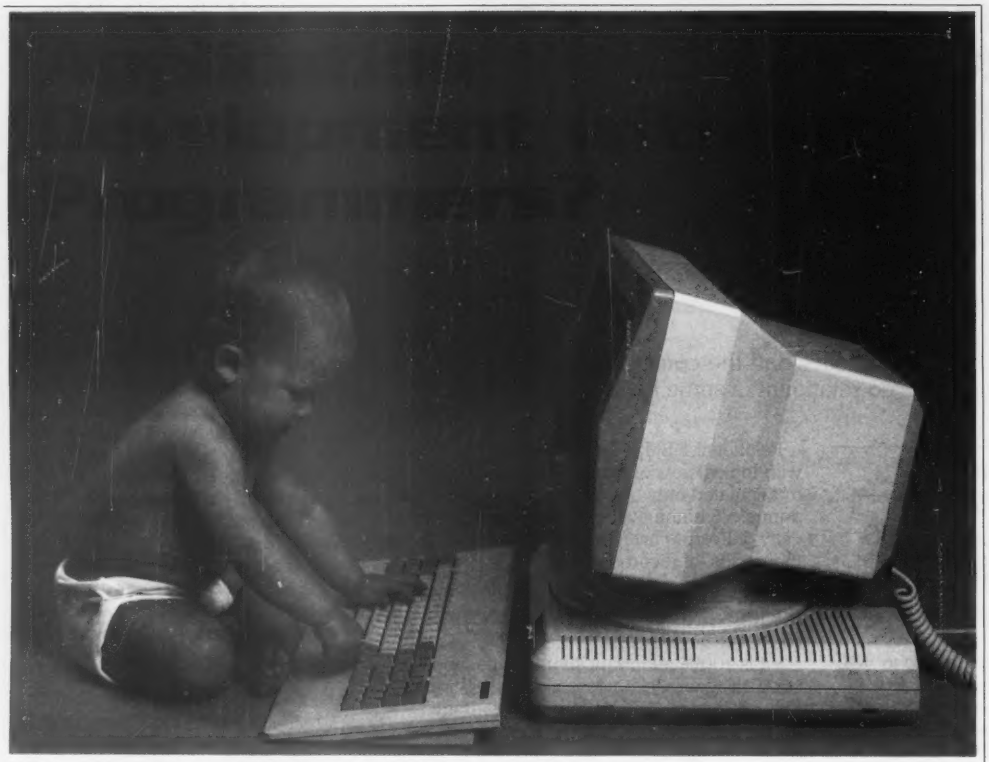
Business users will probably be just as glad to wait for the hard-disk high-resolution color-monitor version of the Mac II, he said. "With no trade-in, no one cares that much about the floppy version," Murphy added. He noted that buyers of the monochrome model will have to pay $999 more to purchase the color monitor once it becomes available.

"Putting in a hard disk is no big deal, but replacing the monitor is going to be painful for people," Murphy said.

Complaints have also surfaced regarding Apple's decision to solder the Mac II's battery onto the motherboard. The battery has been a topic of discussion on electronic bulletin boards, such as Infonet, and in some published product reviews.

The lithium battery apparently has run into persistent problems on some machines when turned off. In one published review, the battery blew out because of cable and keyboard problems, causing the system to die and "forget" about attached internal and external small computer systems interface hard disks.

There are also reports that Apple is having problems with the disk controller for the Mac II's hard disk. "It's true about the hard disk," said Murphy, who has a Mac II at a software development company that he co-owns. "There have been frequent crashes and hard-disk problems," said one Apple dealer, who asked not to be named.



Not in My Lifetime!

The future may bring something new, but today, businesses like yours depend on computer-based online solutions built by professional programmers. However, the tools available to your staff are—

- ☐ Time consuming, complex, tedious command level Cobol.
- ☐ Fourth Generation Languages that ask you to fit your problems to the capabilities of the product.
- ☐ Or bizarre, difficult, cumbersome new languages that offer outrageous productivity claims.

Only to find that any advantages are lost to an insurmountable learning curve or are offset by an extremely painful performance penalty.

That is, until now.

Goal Systems delivers **productivity *and* performance** with **Classic/AL.** The completely online development system for developing complete online applications. With **Classic/AL** you don't get—

- ☐ A strange language your programmers can't or won't learn.
- ☐ A strange development concept that doesn't fit your existing systems or methodologies.
- ☐ A strange pseudo-code that hogs machine cycles during execution.

Instead you get a logical Cobol-skill-based system that doesn't compromise existing standards or naming conventions. You can even utilize existing Cobol copybooks.

You get a system that executes real 370 instructions. Not some interpretive, intermediate code.

You get a single session online environment to design, prototype, develop, test, debug, and maintain real online applications. From the simplest to the most demanding of programs.

Call **800-848-4640** or write today for a free, no obligation trial and complimentary poster.

Classic/AL™

and your professional programmers. Perfect together.

Mail To: **Goal Systems International**
5455 N. High Street
Columbus, OH 43214-1193

Name _____
Title _____
Company _____
Address _____
City/State/Zip _____
Phone ( )

Goal Systems
Software Solutions

Goal Systems International • 5455 N. High Street • Columbus, Ohio 43214-1193 • 800-848-4640

MIS MANAGERS SEEK MAJOR IMPROVEMENTS THROUGH EXPERT SYSTEMS

Six hundred MIS professionals were recently asked to rank key issues facing them today.* Your top five concerns are listed to the right. One company has distinguished itself by helping several hundred organizations utilize expert systems to address these issues. One company can help you use existing personnel, existing computer hardware, existing applications software and EXISTING BUDGET to implement expert systems solutions. The company is Teknowledge.

WHAT SUCCESSFUL APPLICATIONS OF EXPERT SYSTEMS CAN TEKNOWLEDGE SHOW ME?

Teknowledge's expert systems development tools account for more fielded, knowledge-based applications than those of any other AI firm. No company's expert systems tools are available across a wider range of hardware and operating systems. Teknowledge was awarded (1) the first three patents for expert systems software; and (2) the largest Department of Defense contract ever granted a commercial company for expert systems development software.

Expert systems capture human knowledge, and automate its use by many people. In other words, they can be applied where human judgment plays a role:

- Financial Applications: A major US bank has fielded a credit-evaluation expert system.
- Risk Analysis: One of the top-ten international petroleum companies assesses the risks of oil exploration in specific areas.
- Printing and Publishing: One of the largest US newspapers automates the layout and positioning of printing plates.
- Customer Service: A computer manufacturer has embedded a field-service expert system into its international network which diagnoses faults at customer sites BEFORE they occur. An insurance company diagnoses faults and expedites corrective action in 20,000 computers.
- Engineering: An automobile manufacturer uses the output from an expert system to drive a CAD system which produces complete engineering drawings.
- Education: Not only can the accuracy of diagnosed learning deficiencies be verified, but educators are taught to more accurately classify learning-disabled students.

YOUR FIVE TOP CONCERNS AND TEKNOWLEDGE'S SOLUTIONS

1. ISSUE: ALIGNING MIS WITH BUSINESS GOALS

SOLUTION: Expert systems allow you to extend and automatically apply the knowledge responsible for your competitive success. No other company has done this with more applications than Teknowledge.

2. ISSUE: DATA UTILIZATION

SOLUTION: The database revolution allowed us to capture and store data. The expert systems revolution allows us to capture knowledge which utilizes the accumulated data. Teknowledge-based expert systems may be integrated with existing DBMS and other applications, and are portable across mainframes, minicomputers, workstations and PCs.

3. ISSUE: EDUCATING SENIOR PERSONNEL

SOLUTION: Successful implementation of major projects requires senior management understanding and commitment. Teknowledge can customize an executive briefing and help you communicate the strategic potential of expert systems.

4. ISSUE: SOFTWARE DEVELOPMENT

SOLUTION: Expert systems shells are effective high-level programming tools for developing new applications, and for improving both functionality and maintenance of existing applications. Teknowledge's expert system shells, M.1** and S.1*** permit development of applications previously thought impractical due to complexity or cost.

5. ISSUE: PRODUCTIVITY

SOLUTION: Teknowledge understands the costs associated with introducing new technology: Productivity is lowest at the beginning of the learning curve. To minimize these startup costs, Teknowledge has developed a product line that can be applied by your engineers, delivered on your existing computer hardware, and integrated with online applications.

SCHEDULE AN ON-SITE DISCUSSION TODAY.

You have five major concerns: aligning MIS with business goals; data utilization; educating senior personnel; software development; and productivity. You have a budget to address these concerns. Now, you have our phone number, (415) 424-9955, and five very good reasons to use it.

Call or write Teknowledge today, to schedule a no-obligation discussion, at your site, with a team of the industry's foremost knowledge engineering professionals.

My business card or company letterhead is attached.

- ☐ Please call as soon as possible to schedule an in-depth discussion.
- ☐ I'd like to attend the next free, half-day seminar in my area.
- ☐ Please send me a partial customer list and a more detailed discussion of expert systems applications.

TEKNOWLEDGE

Applied Artificial Intelligence

1850 Embarcadero Road
P.O. Box 10119
Palo Alto, California 94303
(415) 424-9955

©Teknowledge 1987.
TEKNOWLEDGE® is a registered trademark of Teknowledge, Inc.

* Washington University Center for The Study of Data Processing as reported in the 11/15/86 DATAMATION, pp 78-86.
** U.S. Pat. 4, 648, 044.
*** U.S. Pat. 4, 658, 370.

Supply firm offers access to proprietary purchasing net

BY ELISABETH HORWITT
CW STAFF

NEW YORK, N.Y. — American Hospital Supply Corp. (AHS) last week revealed plans to sell to its competitors access to its electronic purchasing system — the same system that has reportedly cost leading rivals significant market share during the past few years.

At the annual Intercompany Networking conference held here last week by Boston-based research firm The Yankee Group, an AHS spokeswoman announced that the company will begin a pilot test of a commercial service based on its Analytical Systems Automated Purchasing (ASAP) network.

The service, which will be called ASAP Express, was approved May 7 by AHS parent company Baxter Travenol Laboratories, Inc. AHS began implementing the original ASAP system in the early 1980s, as a way for customers to electronically transmit purchase orders directly to the medical equipment supplier's mainframe.

According to Susan Scott, Travenol's director of marketing, one AHS division reported that sales from customers who began using ASAP in 1984 and 1985 grew 39% by the end of 1986, compared with a 6% average growth. The system is currently accessed by 5,600 customer terminals, she said.

ASAP has become a textbook example of how electronic networking can be used as a strategic weapon. "We and Johnson & Johnson got our tails kicked by ASAP," admitted a representative from another AHS rival who attended the Yankee Group conference.

But now, AHS intends to disarm the system by converting it into a front end that can handle customer orders to any medical supplier through a connection with Rockville, Md.-based General Electric Information Services Co.'s (Geisco) value-added network. ASAP Express will provide a consistent way for customers to place orders; Geisco provides network links to different suppliers' hosts as well as electronic mailboxes that provide document exchange for suppliers and customers without host-based mail systems. AHS's decision to convert a competitive weapon into a profit-generating service reflects change in both the medical equipment market and in Electronic Document Interchange technology, Scott explained. Chief rivals such as Johnson & Johnson and Bergen Brunswig Corp. lost no time implementing electronic purchasing networks of their own. This left AHS with a precarious advantage that depended on the supplier's ability to keep introducing enhancements to its own network services.

Still to be determined, however, is whether competitors will agree to having customer-order data pass through AHS systems. "We don't want a war, with everyone doing his own clearinghouse, but there are some security issues to be resolved," Scott admitted. "We're not sure how excited our competitors will be to have their orders go through ASAP Express."

The company said it plans to have a Big Eight accounting firm certify that the security system prevents AHS from gleaning competitive data from customer transmissions.

When networking means not working, here's a quicker solution.

Fibronics KNET™ Software and Fibronics K200™ Ethernet Controller. The only complete software/hardware system solution that gives your PC's, graphics terminals and engineering workstations faster, more reliable and more secure access to your IBM mainframe (VM or MVS) via Ethernet LAN.

Disk-to-disk file transfer rates are as high as 100 to 110 Kbps. And, Fibronics KNET/K200 System operates within your present security parameters.

It's easy to install and maintain. The KNET/K200 System connects directly to your IBM Block Multiplexer channel and Ethernet and supports TCP/IP standards. Extensive built-in diagnostics simplify system checks to ensure maximum uptime.

The KNET/K200 System is totally supported by Fibronics International, the pioneer in vertically-integrated solutions for on-premises networks.

Fibronics KNET Software/K200 Ethernet Controller System is your best solution for turning "not working" into fast, efficient networking. And we'll prove it. Call 1-800-DOUBLER today for a "no-strings-attached", free 30-day demo. Fibronics International Inc., Communications Way, Independence Park, Hyannis, MA 02601-1892. FAX: (617) 778-0821

Fibronics International Inc.
fiberoptic communications

IBM is a registered trademark of International Business Machines Corp.
Ethernet is a registered trademark of Xerox Corporation.
KNET and K200 are trademarks of Spartacus Inc., A Fibronics Company.

Telenet intros spice ICA show

BY PATRICIA KEEFE
CW STAFF

NEW ORLEANS — The 40th annual International Communications Association (ICA) Conference kicked off here yesterday amid a backdrop of Cajun spice and hot jazz.

About 6,000 to 8,000 attendees are expected at the show, which features 600 exhibitors and four technical session program tracks — management, voice, data and office automation, an ICA spokeswoman said.

Among the products scheduled to be introduced is a synchronous CCITT X.25 service over dial-up lines from Tymnet, Inc. The host must still be hard-wired, but terminals can dial up with synchronous links over dial-up lines for a more cost-effective solution, the vendor said.

Tellabs, Inc. in Lisle, Ill., is set to introduce four new modules that provide subrate capabilities to Tellabs' T-Carrier Cross-Connect Systems. These modules reportedly allow telephone companies that provide Digital Data System (DDS) access to economically and efficiently multiplex and switch DDS circuits.

Infotron Systems Corp. in Cherry Hill, N.J., is scheduled to show two Integrated Services Digital Network (ISDN) terminal adapters, which reportedly provide existing computer and communications equipment with ISDN Basic Rate Interface compatibility.

ALL OF THE COMPUTER PROS IN THE WORLD HAVE PASSED THIS SIMPLE TEST: ➡

Pull Here

CONGRATULATIONS...You passed!

Now take the next step. Fill in the blanks below to get 51 issues of COMPUTERWORLD at the Low Introductory Rate of just $38.95. That's over $5 off the basic rate. Plus you'll receive all 12 COMPUTERWORLD FOCUS issues with your subscription. Just look for our postage-paid envelope that's bound into this issue!

☐ Payment enclosed ☐ Bill me

☐ Charge my credit card ☐ AmEx ☐ VISA ☐ Mastercard

Signature _____ Card Expires _____

FIRST NAME M.I. LAST NAME

TITLE

COMPANY

ADDRESS

CITY STATE ZIP

Address shown: ☐ Home ☐ Office

☐ I'm already a subscriber, but I'd like to extend my subscription at this special low rate. (Attach mailing label above.)

Canada, Central & South America $110/ Europe $165/ All other countries $245 (Airmail).
Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for the special introductory rate.

Basic Rate: $44

COMPUTERWORLD

Detach here, place in envelope, and seal securely.

Please indicate your business, function, and computer involvement below.

1. BUSINESS/INDUSTRY (Circle one)
   - 10. Manufacturer (other than computer)
   - 20. Finance/Insurance/Real Estate
   - 30. Medicine/Law/Education
   - 40. Wholesale/Retail/Trade
   - 50. Business Service (except DP)
   - 60. Government--State/Federal/Local
   - 65. Public Utility/Communications Systems/ Transportation
   - 70. Mining/Construction/Petroleum/ Refining/Agriculture
   - 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. Computer Service Bureau/Software/ Planning/Consulting
   - 90. Computer/Peripheral Dealer/Distributor/Retailer
   - 75. User: Other _____
   - 95. Vendor: Other _____ (Please specify)

2. TITLE/FUNCTION (Circle one)

   IS/MIS/DP MGT.
   - 19. Vice President, Asst. VP
   - 21. Dir., Mgr., Suprv., IS/MIS/DP Services
   - 22. Dir., Mgr., Suprv., of Operations, Planning, Adm. Services
   - 23. Dir., Mgr., Suprv., Analyst, of Systems
   - 31. Dir., Mgr., Suprv., of Programming
   - 32. Programmer, Methods Analyst
   - 35. Dir., Mgr., Suprv., OA/WP
   - 38. Data Comm. Network/Systems Mgt

   OTHER COMPANY MANAGEMENT
   - 11. President, Owner/Partner, General Mgr.
   - 12. Vice President/Asst. VP
   - 13. Treasurer, Controller, Financial Officer

   ENGINEERING
   - 41. Engineering, Scientific, R & D, Tech. Mgt.

   SALES
   - 51. Manufacturing Sales Reps., Sales/Mktg. Mgt.

   OTHER PROFESSIONALS
   - 60. Consulting Mgt.
   - 70. Medical, Legal, Accounting Mgt.
   - 80. Educators, Journalist, Librarians, Students
   - 90. Others _____ (Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - A. Mainframes/Supermins
   - B. Minicomputers/Small Business Computers
   - C. Microcomputers/Desktops
   - D. Communications Systems
   - E. Office Automation Systems
   - F. No Computer Involvement

3317-8720

Plans for info age commission waylaid

Trade association disagreements undermine proposal for federal high-tech panel

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Political infighting among the computer industry's various trade associations has derailed a once-promising legislative proposal to create a national information age commission.

The bill, which would have created a two-year commission to study the public policy issues associated with computer technology, was passed by the U.S. Senate last year. But the legislation appears dead this year due to industry disagreements about the commission's format and purpose, according to industry and congressional sources.

A congressional aide said there are no immediate plans to reintroduce the bill this year because of the industry quarrels, adding that the bill is in limbo while the trade associations attempt to develop a compromise.

The dispute over the commission split the industry's trade associations down the middle, with supporters led by ADAPSO, the computer software and services industry association, and opponents led by the Computer and Business Equipment Manufacturers Association (CBEMA).

MSA's Imlay a booster

ADAPSO had been pushing the legislation since John P. Imlay, chairman of Management Science America, Inc., called for a national commission at the 1983 National Computer Conference. Other supporters included the Data Processing Management Association and the Computer & Communications Industry Association.

But before the bill could be reintroduced for action this year, CBEMA and other industry associations raised strong objections. The critics worried that the commission would become a public forum for groups with complaints about computer technology, such as labor unions, civil liberties groups and environmental organizations. Furthermore, they said that blue-ribbon panels usually generate recommendations for government action or regulation.

"A highly visible, unfocused [commission] would quickly become the arena for attacks on the industry, not reasoned debate," said a recent letter to ADAPSO from CBEMA, the Information Industry Association, the Electronic Mail Association and the Electronic Industries Association.

The proposed 23-member information age commission would have studied such topics as privacy, employment, technological innovation, education, national defense and international competitiveness as part of a comprehensive analysis of the effects of information systems on society.

Seeking private-sector control

CBEMA supports ADAPSO's goal of identifying and alleviating public concerns about computer technology but wants the private sector to control the agenda and address the issues on a continuing basis, CBEMA spokeswoman Charlotte LeGates said. She said it is not in the industry's or the public's best interests to turn the issues over to a commission that would become a "media circus."

George T. DeBakey, executive director of ADAPSO, acknowledged that the episode was somewhat embarrassing for the bill's chief supporters — ADAPSO, Imlay and Fred Lafer, senior vice-president and general counsel of Automatic Data Processing, Inc. They had pressed Sens. Frank R. Lautenberg (D-N.J.) and Sam Nunn (D-Ga.) to sponsor the bill.

"We're disappointed. We still feel that it is a good idea. Obviously, John Imlay, Fred Lafer and ADAPSO put a lot of time in this," DeBakey said. "We would have liked to have had people express their concerns earlier, so we wouldn't have gone this far down the road."

Possible alternatives

Officials at several trade associations said last week that they have formed a working group to find out if there is a way to salvage the concept of a high-tech issues panel, perhaps as a private-sector industry council.

Forging a compromise will not be easy, however. While ADAPSO still wants a public discussion of information age issues, CBEMA wants a council that would coordinate the high-tech industry's lobbying strategy. LeGates said CBEMA is willing to go along with suggestions that the industry council also discuss the future of information technology and public policy.

"We're in a kind of reconsideration stage, to see if there's a consensus among the various groups about where we go from here," DeBakey said.

Microsoft backs off claims of Windows-OS/2 compatibility

BY DOUGLAS BARNEY
CW STAFF

REDMOND, Wash. — Microsoft Corp.'s early claims that its Windows graphics user interface would be largely compatible with OS/2 were simply not true, and Windows developers must now rework applications to run under the new operating system, according to Microsoft and developers.

"Microsoft said if you develop for Windows, it would simply be a recompile to work under OS/2. They came back last month and said, 'Oops,' " said Mark Finger, a systems designer for Innovative Software, Inc., which is developing Windows applications and applications for the Presentation Manager, a derivative of Windows that works with OS/2. Microsoft's statements were made at Windows developers conferences held early last year.

Another key developer agreed. "They assured developers of how little effort it would take to move to the Presentation Manager, saying the effort was either nonexistent or minimal. At one point, they even said they would be binary compatible. That is certainly not the case," said the developer, who asked not to be named.

Compatibility sacrificed

According to developers, the incompatibility arose when Microsoft negotiated a deal with IBM to make Windows a key part of OS/2. IBM demanded changes to improve Windows, and those changes resulted in the incompatibility.

According to Microsoft, the incompatibility was a necessary result of improving the product. "Initially, it was our goal to make it that simple [to just recompile and run under OS/2]. However, in favor of building a more advanced technology, that wasn't an achievable goal," said Tandy Trower, Microsoft product manager for Windows.

"What happened with the OS/2 Presentation Manager," Trower said, "was a merger of technology. We took our existing technology, and IBM brought to the table their powerful graphics technology," that being IBM's Graphical Data Display Manager.

Microsoft will ship tools as part of its OS/2 Developers Toolkit to help developers move Windows applications to the Presentation Manager. "They will probably be available later in the year," Trower said.

Following IBM's lead

Firms that have had advanced information on IBM's and Microsoft's plans, such as Lotus Development Corp. and Ashton-Tate, have mainly skipped over Windows and are developing primarily for the Presentation Manager.

"For a long time, we have been tracking the interplay between Microsoft and IBM, and rather than announce support for Windows, we said we would support whatever IBM supported. We were aware that it might not be likely that IBM would support Windows as exactly constituted today," said Roy Folk, vice-president and general manager of the Software Products Division of Ashton-Tate.

Some developers appear unconcerned that the Presentation Manager is incompatible with Windows. "If we follow Windows' guidelines, the amount of rework to get to OS/2 is minimal. We are 95% of the way there," said Burt Rubenstein, vice-president of research and technology for Index Technology Corp., a Cambridge, Mass.-based software developer.

Even Microsoft critics agreed that writing for the current Windows will help port applications to OS/2 and the Presentation Manager. "It is as close to working with the Presentation Manager as you can get," said the developer, who asked not to be named.

Advertisement

Advertisement

Gil Roeder and his team teach a whole staff C for less than one Seminar fee

C Language Made Easy To Learn

Programmers call it the most comprehensive C course ever, and first video package they like enough to finish

It's incredible" says a software manager at a Silicon Valley instruments company, "I've never seen programmers get up to speed in C so fast. They get totally drawn in, and they *remember everything.*"

Gil Roeder of Hands On Learning, who developed this remarkable workshop, says customers like C for its power and portability, but hit snags getting staff up to speed. "C can be tricky at first. On the job training is too slow and distracts senior staff. Seminars (and travel) are too costly, and often disappointing".

The Solution: Now, the *All Hands On C Video Workshop* gets staff up to speed faster and better than ever before, at far lower cost. The workshop contains six professionally produced video modules that teach the full features and capabilities of the C language from operators and expressions through pointers and structures.

Students review lesson content with workbook exercises, and each module builds practical programming experience with sample programs provided on the C Video Workdisk. The package includes the acclaimed text "Learning to Program in C" by Dr. Thomas Plum, international authority on C and technical advisor to Hands On Learning.

The Secret: Roeder and his company have helped thousands to master computers and software. The secret of their system is its focus on people: using human experience to teach technical concepts. "It's like learning by osmosis" says one student, "I had no idea I was getting so much. When the tapes ended, I just started programming."

The All Hands On C Video Workshop is available in VHS or Beta at $995, and other formats at additional charge. We are sure you will find it an exceptional value. However, if you are not fully satisfied, return it for a full refund for up to 30 days. To order, or for more information, please call us or send this coupon with your business card or letterhead. Thank you.

Hands On Learning Corporation
Three Courthouse Lane, Dept 720
Chelmsford, MA 01824
(617) 458-1130 Ext. 720

Zenith preps eye-opening PC monitor

BY DAVID BRIGHT
CW STAFF

NEW YORK — Capping several years of research, Zenith Data Systems Corp. last week formally introduced a personal computer color monitor with a flat screen said to offer up to 50% more brightness, up to 70% better contrast and 95% less glare than conventional CRTs.

"Once you use it, you will never want to use a conventional monitor again," President Robert Dilworth claimed. "The Flat Technology Monitor displays images with precision never before possible in a PC monitor."

With a retail price of $999, the new 14-in. monitor costs at least $300 to $400 more than the average color monitor and $100 more than an NEC Home Electronics, Inc. Multisync monitor. The monitor is compatible with the IBM Personal Computer and includes a connector for the IBM Personal System/2. Deliveries are set to begin this summer.

When he demonstrated the Flat Technology Monitor at the Computer Museum in Boston last month, Dilworth claimed that monitor technology is entering a new era. "What we have here is the beginning of a new CRT technology that will allow us to give better and better resolution, get rid of the glare and . . . make a better picture," Dilworth said.

At that meeting, Dilworth said that a 640- by 480-pixel Flat Technology Monitor can produce color-slide quality images, and the technology can eventually support 2,000- by 1,000-pixel resolution.

End of the tunnel?

While many users of computer-aided design (CAD) systems now must work in dark rooms in order to get good detail on conventional curved CRTs, the new monitors will eliminate that necessity, Dilworth said. In addition to providing better picture quality for CAD and most types of applications, the new technology will cause less eye strain, he added.

Because of extremely high manufacturing costs, Dilworth said, a wide range of Flat Technology Monitor screen sizes will probably not be available in the near future.

Both the new tube and conventional CRTs use a thin metal shadow mask with hundreds of thousands of perforations that direct beams from an electron gun on to the screen. The masks on conventional CRTs are subject to movement; with the new tube, the shadow mask is stretched flat and held firmly under high tension behind the tube's faceplate.

The NEW SmarTerm® Family of Terminal Emulators

NEW! SmarTerm 240 version 2.0
Now with precise full-screen DEC VT241* four color display of ReGIS* graphics pictures. In addition, DEC VT240 and Tektronix* 4010/4014 graphics terminal emulation, and DEC VT220, VT102, VT100, and VT52 text terminal emulation. Includes TTY mode, and text and binary file transfer.

NEW! SmarTerm 2392
SmarTerm 2392 emulates the popular Hewlett-Packard HP2392* text terminal. Use SmarTerm 2392 to access your HP3000 host or Personal Productivity Center*. Supports ANSI, EM52, and TTY modes. Includes text and binary file transfer with Kermit and Xmodem error-free file transfer protocols.

NEW! SmartMOVE*
Combines power, ease of use, error-free file transfer and VT100/102 emulation in one "smart" communications software buy!

SmarTerm 220
DEC VT220, VT102, VT100, and VT52 text terminal emulation. Includes TTY mode, and text and binary file transfer.

SmarTerm 4014
Tektronix 4014/4012/4010 and RetroGraphics* VT640 graphics terminal emulation, with DEC VT102, VT100 and VT52 text terminal emulation. Includes TTY mode, and text and binary file transfer.

SmarTerm 400
Data General Dasher* D410, D400, D211, D210, D200, and D100 terminal emulation. Includes TTY mode, and text and binary file transfer.

All SmarTerm products are available through a dealer near you. For more information about our new family of terminal emulation and communications software, respond to the reader service number listed below. Or contact:

PERSOFT, INC. · 465 SCIENCE DR. · MADISON, WISCONSIN 53711 USA
(608) 273-6000 · TELEX 759491 · FAX (608) 273-8227

persoft®

Users prefer generic nets

BY PATRICIA KEEFE
CW STAFF

AMELIA ISLAND, Fla. — Users coping with multivendor networks are more inclined to support generic, or industry-wide, standards than proposed IBM standards, according to a poll taken at a recent conference on internetworking held here.

As a result, improving network management, particularly providing multiple protocol support, is both a critical issue and a top priority, said attendees surveyed at Framingham, Mass.-based International Data Corp.'s (IDC) annual Spring Executive Conference.

IDC asked attendees to respond to a series of statements concerning support for and interest in a variety of standards, key technologies and organizational issues. About half (126) of the conference attendees, more than 50% of whom are government users, responded.

The poll revealed that on average, communications spending was increasing faster than data processing spending. But government users were more likely to cite communications as a top management concern.

Both the survey results and similar comments made by a number of speakers appeared to undermine the following commonly held axioms about the networking market:

- Users are not installing networks because they are waiting for the dust to settle on the standards issues.
- Users prefer one-vendor networks.
- Users rely on third parties to guide them through the networking maze.

According to the poll, vendors do not support standards for two reasons: they are confused by unclear specifications or they do not believe that standards such as those proposed by IBM are in their best interests.

Survey respondents expressed an irreverent view toward two proposed IBM standards, predicting that neither IBM's Netview network management software nor the IBM Cabling System are likely to become dominant industry standards. Despite doubts about vendor commitment to these standards, users clearly back the notion of standards and standards committees, particularly generic standards supported across a wide range of architectures.

WITHOUT DATA GENERAL, INTEGRATING YOUR SYSTEMS IS LIKE MIXING OIL AND WATER.

FOR FULLY INTEGRATED BUSINESS AUTOMATION, TALK TO DATA GENERAL.

To maintain a competitive edge, a business needs to integrate all its resources. Ultimately blending people, departments, data and computer systems together.

Data General's Business Automation Systems integrate all these vital elements. Which gives your company one, accessible information flow.

Our industry-leading CEO® software gives you the most integrated business automation essentials. With spreadsheets. Graphics. Decision support. Tools that help you make faster, better informed business decisions.

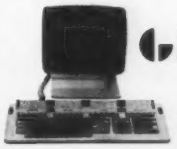
Then we take you further. By letting you integrate your existing applications.

Our communications story is second to none. We give you the most complete IBM compatibility. We also adhere to industry standards like Ethernet® and X.25.

So our business automation solutions integrate all levels of your company. From PC's to mainframes. And from the next room to the next continent.

Our MV/Family systems lead the industry in price/performance. And give you a low cost of ownership, along with service, training and support.

Today, over 165,000 CEO users have discovered true integrated business automation. To create the best possible blend for your business systems, talk to Data General. Call 1-800-DATAGEN (Canada call 1-800-268-5454.) Or write: Data General, 4400 Computer Drive, MS C-228, Westboro, MA 01580.



Data General
a Generation ahead.

©1987 Data General Corporation. CEO is a registered trademark of Data General Corporation. Ethernet is a registered trademark of Xerox Corporation.

THE SAS®

Fourth Generation Software

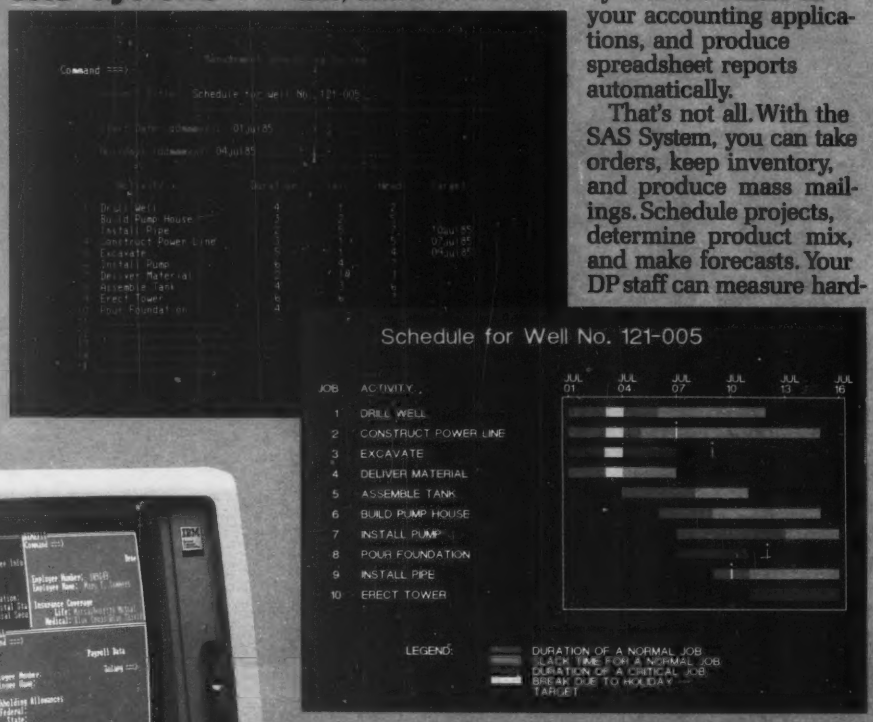
Now there's one software solution for all your Information Center needs. One solution for all your applications, for all your mainframes, minicomputers, and microcomputers. One solution—the SAS® System.

One Solution to Integrate All Your Computing Tasks.

The SAS System gives you efficient data management, superior statistical tools, an easy report generator, customized presentation graphics, and more. Choose between the simple English-like command language or a front-end menuing system with fill-in-the-blank screens. On-line help facilities make it easy to handle every application, quickly and accurately.

You can track sales leads, manage prospect files, determine market share, and present results with the SAS System. Plus you can file employee and applicant records, analyze benefit programs, and manage the payroll. The SAS System can handle all your accounting applications, and produce spreadsheet reports automatically.

That's not all. With the SAS System, you can take orders, keep inventory, and produce mass mailings. Schedule projects, determine product mix, and make forecasts. Your DP staff can measure hard-



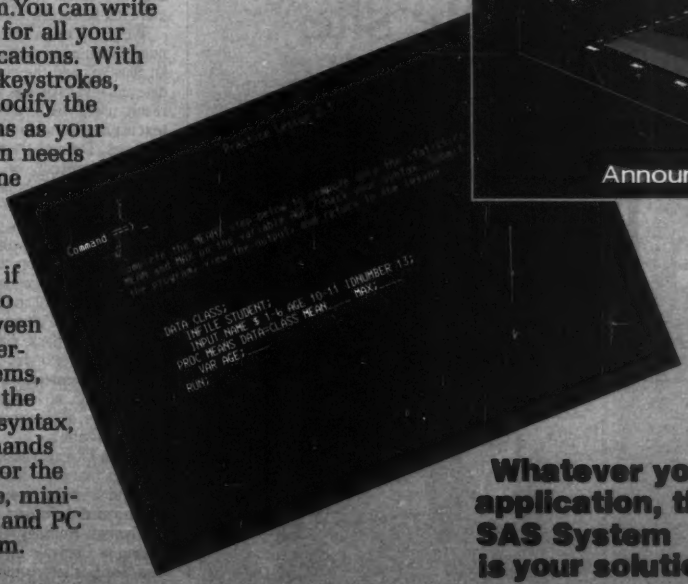
SYSTEM
for Your Information Center.

ware resources or system usage, test data bases, and run production programs.

One Solution that's Friendly.

It's simple with the SAS System. You can write front-ends for all your SAS applications. With just a few keystrokes, you can modify the applications as your information needs change. One language handles all your tasks. And if you need to move between several operating systems, you'll find the language, syntax, and commands the same for the mainframe, minicomputer, and PC SAS System.

computer-based training. Technical support is provided for our mainframe, minicomputer, and microcomputer users, and documentation comes with your system.



Call us today. International customers, call the International Marketing Department for information on your local distributor.

Whatever your application, the SAS System is your solution.

One Solution with Full Support.

Training is easy too. We offer instructor-based, video-based, and

SAS Institute Inc.
SAS Circle, Box 8000
Cary, North Carolina
27511-8000, USA.

(919) 467-8000, x280
Telex 802505

The SAS System runs on IBM 370/30xx/43xx and compatible machines under OS, TSO, CMS, DOS/VSE, SSX, and ICCF; on Digital Equipment Corp. VAX™ 8600 and 11/7xx series under VMS™; on Prime Computer, Inc. Prime 50 series under PRIMOS®; on Data General Corp. ECLIPSE® MV series under AOS/VS; on IBM XT/370 and AT/370 under VM/PC; and on IBM PC XT and PC AT under PC DOS. Not all products are available on all operating systems.

SAS is the registered trademark of SAS Institute Inc., Cary, NC, USA. VAX and VMS are trademarks of Digital Equipment Corp., Maynard, MA. PRIMOS is the registered trademark of Prime Computer, Inc., Natick, MA. ECLIPSE is the registered trademark of Data General Corp., Westboro, MA.
Copyright © 1985 by SAS Institute Inc. Printed in the USA.

Javelin lets fly with enhanced package

Takes aim on corporate market with claims of date, text variable capabilities, added power

BY DOUGLAS BARNEY
CW STAFF

CAMBRIDGE, Mass. — In an attempt to leverage the success of last year's $99 price promotion, Javelin Software Corp. today is set to announce Javelin Plus, a $249 version of its financial modeling software with enhanced data base and financial modeling capabilities.

The product is aimed at anchoring a position for Javelin in the corporate market, the company says. The firm now offers the original Javelin financial modeling package — which once sold for $695 — for $99, with the intent of providing an inexpensive way for new users to try the software. Javelin Plus is said to be upward-compatible with the original Javelin.

Javelin's low-price marketing strategy is a major change for the firm, which burst into the market in October 1985 with bold claims of competing head-to-head with Lotus Development Corp.'s market-leading 1-2-3. While Javelin promised a new approach to spreadsheet-type analysis, the target market of Lotus users was reluctant to switch to an unproven product. Javelin's central data base and model-oriented approach required spreadsheet users to rethink the way they approached their work, and many users were reluctant to try the product.

"If we take die-hard spreadsheet people and try to give them Javelin, it is like having teeth pulled until they learn it. But novices just fall into the Javelin way of thinking," says Wayne Sadin, who is vice-president of MIS for Murray Financial, located in Dallas.

As a result of the stubbornness or contentment of many users of 1-2-3, Javelin's sales failed to meet the company's expectations. Javelin shipped only 15,000 copies of the product in its first year of availability and laid off the bulk of its sales staff in August 1986.

In reaction to slow sales, Javelin followed the example of Borland International and Dac Software, Inc., both of which reaped enormous success selling low-cost, high-quality software in large volumes.

Cuts spurred sales increase

In October 1986, the price of Javelin was slashed to $99, and pent-up demand resulted in sales of 10,000 units during the first 10 days following the price cut, Javelin Chairman Rob Firmin says. Javelin's installed base is now said to be some 52,000 units. Javelin Plus is aimed at current Javelin users who need more power and new users who may be lured by a more full-feature product.

While the original Javelin worked primarily with numeric-based models, Javelin Plus will add the ability to work with date and text variables, the firm says. As a result, users will be able to enter date or text in place of numbers and enter dates in formulas. Through the date functions, users will reportedly be able to compare dates, calculate days between dates and find the start and end dates of formulas. The product's ability to handle string variables reportedly will let users respond with words or numbers to questions posed by prepackaged Javelin models.

For Arthur Holland, finance manager for Walt Disney Pictures at The Walt Disney Co. in Burbank, Calif., the ability to have date and text strings serve as data is a key improvement. As a result, Holland says, he will no longer have to work around this shortcoming by setting up dummy variables.

Javelin Plus also has new data base capabilities that provide cross-tabulation of data and selecting and sorting of records within a model, the firm says.

Thomas Holladay, DP manager for trading at Cresvale International, Inc. in New York, is interested in the product's data base capability. "It essentially becomes a large memory-resident memory data base. The cross tabs let me do the sorts of things that would ordinarily require a data base program," he says. Cresvale currently uses Javelin to manage the trading of convertible bonds and warrants.

Javelin Plus will also reportedly offer an open architecture approach allowing third-party and corporate developers to write applications that work with Javelin. Some of these applications, dubbed "snap-in building blocks" by Javelin, will come with Javelin Plus. Javelin plans to offer four applications within Javelin Plus: multiple regression analysis, histogram, forms input and "what-if" scenario analysis. Other blocks set to come from Javelin include forecasting features such as Box Jenkins and Monte Carlo Simulation, as well as optimization features such as goal seeking, the company says.

Javelin Plus reportedly will provide sophisticated data consolidations and can have a nearly infinite number of source variables leading to 16,000 summary variables, the firm said. "More and more companies are turning away from Cobol-based mainframe systems for consolidation," Firmin says.

All it takes is our STD 1600.

The STD 1600 data communication terminal provides efficient, reliable, timely data transfer to eliminate the overnight wait for delivery. It communicates with any bisynchronous terminal or computer.

The STD 1600 can communicate on-line or off-line at speeds up to 56KB to get time-sensitive data from one location to another.

The STD 1600 supports dial-up or leased lines and is easy to use. No software required, and installation can be accomplished in less than an hour.

Since 1969, Mitron's magnetic tape systems have been used in a wide variety of data communications applications. Let us explain how you can connect the STD 1600 to your system or data communication network. Can be leased or purchased.

Call 800 638-9665 (in Maryland, 301 992-7700).

MITRON
Systems Corporation
2000 Century Plaza, Columbia, MD 21044

Multiuser PC data base said to end data integrity, speed woes

BY ED SCANNELL
CW STAFF

BELMONT, Calif. — Ansa Software last week announced a multiuser version of its Paradox data base that allows an unlimited number of users to access the same file simultaneously.

Ansa claimed the product, called Paradox 2.0, is the first data base to offer multiuser capabilities while providing full data integrity and maintaining the speed of the original product.

"They have done some very nice things [with Paradox 2.0]," said Adam Green, a data base consultant. "One user can change a record, and another can see it immediately — and that's pretty impressive," he added.

The program, which can be used in either single tasking or multiuser mode, is said to work with all major networks, including 3Com Corp.'s 3Plus, Novell, Inc.'s Novell Advanced Netware and IBM's Token-Ring and PC networks.

'Expert' input sought

"We worked with networking experts, corporate managers, developers and end users for 18 months to make sure it would meet their needs," said Rob Shostak, Ansa's cofounder and co-developer of Paradox 2.0.

"Their input made it clear that just another Band-Aid multiuser solution wouldn't suffice," Shostak added.

Network users can take full advantage of Paradox's multiuser features, such as autorefresh — which automatically updates information to the screen as it is revised by others — automatic table and record locking and "deadly embrace" protection, which prevents the program from crashing when one or more users seeks access to the same information at the same time.

Multiuser data bases on networks have not become popular, according to Richard Schwartz, Paradox co-developer, because most force the user to give up abilities he has grown accustomed to in single-user environments.

Secret of success?

"There haven't been any [successful] multiuser data bases on networks because you can't control your own destiny. You grow to expect a certain set of capabilities, like querying and data entry," Schwartz said.

"The problem in multiuser data bases is those capabilities aren't carried over," he added.

Ansa officials claimed Paradox's ability to simultaneously access all records that can be transparently shared is unique. They also claimed competitive products prevent users from working once they encounter a locked record and leave users guessing as to who locked them out.

Record locking levels

With Paradox 2.0, users can reportedly look at a record that is being edited. If the record is currently being used, the name of the user who has locked the record is displayed.

The program has four levels of record locking, according to Schwartz. Full lock prevents any other user from gaining access to a file, prevent-full lock prohibits any user from executing a full lock, write lock allows users to access a record but not lock it and prevent-write lock prevents users from declaring the table "nonwritable," Schwartz explained.

Paradox 2.0 is not directly compatible with files from Ashton-Tate's Dbase III Plus but can convert them for use through its data conversion facility. Some observers said this lack of direct compatibility is a drawback.

"That was a mistake they made that they can never really rectify," said Jeff Tarter, editor of "Softletter," a biweekly newsletter based in Cambridge, Mass. "They [Ansa] and Microrim, Inc. have managed pretty well without it, proving there is a market for non-Dbase-compatible products," he added.

EMS support

Other features of the program reportedly include support for the Lotus/Intel/Microsoft Expanded Memory Specification and the ability to create custom menus for querying, in addition to data entry and word wrap for use in creating forms and writing reports.

Paradox 2.0 also includes an improved edition of the Paradox Personal Programmer, which is an applications generator that enables developers to set up a range of data management aplications by making selections from the menus, according to Ansa.

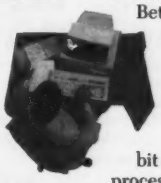
Ansa is offering existing Paradox users an upgrade to 2.0 for $199.

Paradox 2.0 costs $725 with the Paradox 2.0 Network Pack, which supports six users, priced at $995. Both versions will be available in either 5¼- or 3½-in. disk formats. Single copies of Paradox 2.0 and Network Pack can be used to support network applications by any number of users, according to a company spokesman.

Ansa said it plans to ship the program June 1.

Streamline your DP operations with a Tandy® 3000 HD system and XENIX®.

Break away from your mainframe with the powerful Tandy 3000 HD and the versatile XENIX System V operating system. The high-performance Tandy 3000 HD helps make systems development more efficient and cost effective.



The Tandy 3000 HD is compatible with the IBM® PC AT, yet offers greater hard disk storage (40 MB vs. the PC AT'S 30). Better yet, the 3000 HD is priced at only $4299 (vs. $5295 for the PC AT*).

Based on the 16-bit Intel® 80286 microprocessor, the Tandy 3000 HD (25-4011) operates at 8 megahertz. And since the 3000 HD is a multiuser system, people throughout your office can access it from inexpensive data terminals, for program development, as well as user applications.

Come into a Radio Shack Computer Center today. The Tandy 3000 HD is your key to total office automation.

Send me a Tandy 3000 brochure.
Mail To: Radio Shack, Dept. 87-A-1053
300 One Tandy Center, Fort Worth, TX 76102

Name _____
Company _____
Address _____
City _____ State _____
ZIP _____ Phone _____

Radio Shack
COMPUTER CENTERS
A DIVISION OF TANDY CORPORATION

*Based on IBM price list as of January 1987. Tandy 3000 HD price applies at Radio Shack Computer Centers and participating stores and dealers. Monitor, data terminals and XENIX sold separately. XENIX/Reg. TM Microsoft Corp. IBM/Reg. TM International Business Machines Corp. Intel/Reg. TM Intel Corp.

EDITORIAL

Getting respect

IBM's largest customer will spend a whopping $3.3 billion this year on MIS, employ 30,000 people within MIS and see its MIS outlays grow at about 18% annually, despite the general downturn in capital spending. That customer is IBM.

As this week's Executive Report, The Cobbler's Children (see page 59) shows, that kind of attention to internal MIS operations is more the rule than the exception at computer vendor companies.

More importantly, it is these companies that — perhaps even more than their most compute-intensive customers — recognize the strategic importance of a well-financed, judiciously operated MIS department.

As the article points out, many vendor companies have recently reorganized their MIS departments to reflect the recognition of that strategic importance. In general, these reorganizations weave the MIS function more tightly into the fabric of the corporation. As Cullinet Software, Inc.'s MIS director puts it, more people than ever at his company realize the importance of sound information systems, and running the company well actually depends on good systems.

This attitude is quite different from the prevailing philosophy within many, if not most, vendor companies just a few years ago. Because MIS did not contribute directly to selling or marketing a company's products, it was relegated to a relatively low status within the corporation. Vendor MIS often went begging for state-of-the-art hardware, while older installed systems could not keep pace and support new software. To quote a much overused phrase, MIS just got no respect.

Sound familiar?

Clearly, there are worthwhile lessons that mainstream MIS should glean from the vendors' experiences outlined in the report. Corporate higher-ups within vendor organizations are intrinsically no different from upper management in a bank or manufacturing organization. As noted, for years top managers regarded MIS no differently than their nonvendor counterparts.

Those managers had to be educated as to the strategic importance of MIS as a vital cog in the profit apparatus. This education process was hastened, not hampered, by intelligent information directors, who recognized that their No. 1 priority was to facilitate the movement and absorption of information technology throughout the corporation.

We believe that the stereotypical MIS shop — with its glass walls, distinctly different managers and separate career paths within a corporation —will disappear within a decade. MIS should promote this inevitability and will benefit greatly as a result. One close look at the evolution of MIS in the leading-edge vendor companies makes these facts clear.

LETTERS TO THE EDITOR

Three is no crowd

There is no question that for many people venturing into desktop publishing, the way to go is to buy a turnkey system, as the article, "Balance of elements" [CW, April 13], suggested. Thus, Packard Bell joins its esteemed competitors — Xerox Corp., Canon, Inc., etc. — but offers not one, not two, but three IBM Personal Computer AT-compatible desktop publishing configurations.

It is our belief that this trio, with prices ranging from approximately $6,000 to $13,000, provides users with the ultimate flexibility to meet whatever might be their specific needs. In this arena, three is not a crowd. It is simply an appropriate response to the market.

Larry Metz
Executive Vice-President
Packard Bell
Woodland Hills, Calif.

MAP opposition

There is one reason for Ken Olsen to publicly oppose the Manufacturing Automation Protocol (MAP) that was not mentioned in "Users boo Olsen's MAP attack" [CW, April 20]. As Olsen stated in a *Boston Globe* article on March 25, 'We don't think it [MAP] is going to work."

General Motors Corp. grasped the problem of integrating heterogeneous nodes into a single, harmonious network but, as Olsen pointed out to the *Financial Times* [*Fortune*, March 30], GM had no business pretending that it could specify a solution for that problem.

Neither MAP nor any other network architecture based on the ISO's Open Systems Interconnect (OSI) reference model deserves serious consideration as the basis for networking the factory of the future.

It is this interpretation of Olsen's MAP attack that needs to be heard by those charged with planning industrial networks — not the self-serving protests of the MAP zealots quoted by *Computerworld*.

On the other hand, neither Decnet nor any other Ethernet-based network architecture can support the networking requirements of computer-integrated manufacturing.

Thus, there had better be alternatives to OSI and Ethernet, or the factory of the future is not going to be realized. Fortunately, there are several.

David Nelson
Information Engineering
Garmisch-Partenkirchen,
West Germany

This week in history

May 16, 1977
State or federal privacy legislation will impact all DP shops that maintain records about individuals by requiring that systems provide only extremely limited access to data base records, a federal Privacy Protection Study Commission staffer maintains.

May 17, 1982
Arthur Harkins of the University of Minnesota predicts that by the year 2000 people will be "marrying" robots as surrogate human beings. The first beneficiaries of such human/robot connections will be burn victims, the very lonely or remote or people in prison who will enter the union "for a weekend, for a year, until the burn scars are healed or the personality retrieves itself from its depths," Harkins says.

True professional

With tongue placed firmly 'tween cheek and gum, I commend *Computerworld* for printing William Harrison's article, "Over the rainbow in a software garage shop" [CW, April 27]. It is reminiscent of Meilir Page-Jones's article, "The best policy is missing deadlines — sometimes" [CW, Sept. 30, 1985]. Such antiestablishment sentiments must have many software engineering pundits shedding tears over their polished mahogany desks as they cry "Heresy."

Seriously, though, as one who had his first hands-on computer experience in 1957 helping to build the ground-installed radar data handling system, I am pleased to read such an intelligent discourse from one who predates me in computing. I was beginning to believe that there were no more computing dinosaurs left — that we had *all* been vanquished from the modern-day "vaporware" environment of structured project management, which places emphasis on preemptive prevaricative positivism and the dark-blue pinstriped suit as evidence of "professionalism."

Harrison's reminder that commitment, perseverance, integrity and cognitive ability identify the truly professional software engineer is most welcome, and his arguments in favor of intelligent, responsible management in the "garage shop" and "skunk works" environment are quite sound.

Robert R. Cromer
Irving, Texas

The rise and rise of MIPS cost

Making sense of the ups and downs of price/performance

CHARLES P. LECHT

During the past 30 years, incredible performance improvements have been realized by computer systems manufacturers. These, in turn, have been passed on to users in the form of price improvements. Together, we call the two price/performance improvements.

In every computer system classification — from micro to supercomputer — the price/performance improvements achieved in the past 20 years have to be measured in units of hundreds of thousands. A comparison of the price and performance of an IBM 1401 (circa 1965) and an IBM Personal Computer AT of the 1980s provides us with just such a dramatic example.

Now, get ready for a surprise. While the average cost per million instructions per second (MIPS) per computer systems class has been dropping, the average of these averages for total systems has done nothing but rise.

In order to better understand this apparent contradiction, think of the entire community of computer users in America as having been merged to form a single company. Call it Company X. Think of the entire computer-producing community of manufacturers as Company Y. The above assertion says the average amount spent on a single MIPS bought by X through purchases from Y is constantly rising, despite the the fact that the average cost per MIPS in every sector of Y's technological offerings is decreasing.

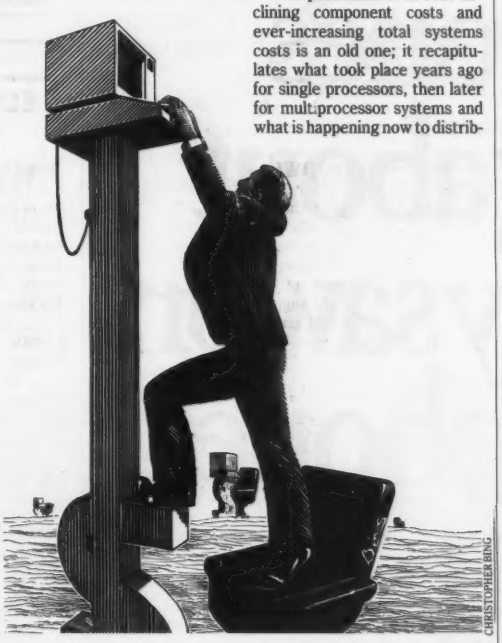
The average of averages

This amazing fact gives rise to this question: How can the average of a set of ever-decreasing averages rise? This question is answered by the simple trick of adding new, ever-decreasing averages to the last set you performed the average of averages upon, while ensuring that the sum of the averages of those is larger than the sum of the declines in the last set during the time interval that marks both.

Think of it this way: The bigger the airplane, the greater the cost of flying it one mile (albeit, the bigger the payload.) Also, as with processors, new classes of airplanes are constantly being added to the market.

If you buy what I've thus far offered — and I believe there is every reason that you should — we can move on to its meaning. It is no surprise that as time passes, the disposition of users is to buy more and more automation.

When they do, they usually opt for bigger and bigger systems while, at the same time, filling in "performance holes" in their previous systems environments. The fact that they are spending more and more on a commodity that is touted as costing less and less may be somewhat obscure.



CHRISTOPHER BING

We cannot help but feel slighted anyway; usually when you buy more, it gets cheaper. While notice of this phenomenon has appeared in various journals, its mention in less scholarly circumstances seems particularly relevant to me at this time.

Today's larger computer systems applications, for the most part, involve networks of different-sized processors. The low and the high end of these processors have been undergoing steady changes to enhance the data processing roles they play.

Stretching system power

At the low end, we find an increasing flood of user-friendly devices that enhance data capture and dissemination, while reducing the scientific demand on users that past devices required. At the high end, we find processors of increasing power that let users tackle bigger jobs with their systems. Together, these micro and macro technologies may be envisioned as stretching total system power to encompass a wider data processing role.

Additionally, a wider range of in-between facilities are now available to meet the demand of ever-increasing articulation. It is these add-ons, particularly at the high end, that are keeping the price-per-MIPS rising for an entire system of processors while, ironically, its component parts offer a decrease.

The phenomenon of ever-declining component costs and ever-increasing total systems costs is an old one; it recapitulates what took place years ago for single processors, then later for multiprocessor systems and what is happening now to distributed systems. It is appearing for clusters of distributed systems tied together in local-area networks, value-added networks and integrated services digital networks (ISDN).

More MIPS for the money

Now, if you are a computer systems maker and you are selling MIPS in clusters of different-sized processors that vary from micro to macro, the above observation means nothing but good news: The more MIPS your customers buy, the more you can obtain per MIPS. This point has to be at the heart of the corporate plan for every successful computer systems manufacturer that wishes to remain so.

If you are the vendor of just one range of processor, the news isn't so good: The most you can hope for is a static price per MIPS, ever declining as time wears on.

Continued on page 22

Lecht is chairman of Lecht Sciences, Inc./Japan, a Tokyo-based software think tank specializing in graphics. He is also an elected public member of the Hudson Institute and a free-lance science writer.

Distributed DBMS: Get only what you need

SHAKU ATRE

It appears, looking at the newspaper advertisements, that the latest medicine for all data processing ills is a distributed data base management system.

Every magazine, when opened, drops a card for Oracle Corp.'s free seminar on getting enlightened about the distributed data base architecture. Relational Technology, Inc.'s Ingres is not far behind in going after the stars.

But does any vendor sell a truly distributed DBMS? I don't think so.

About six months ago, I sent 10 vendors a letter containing an extensive matrix of features that would make a DBMS a distributed DBMS. These vendors are ones who claim their products include the extrasensory powers of the distributed DBMS besides being, of course, relational. To date — no response.

Atre is president of Atre International Consultants, Inc. in Rye, N.Y., which markets Atre Methodology for data base planning, design, implementation and management and provides consulting and training in data base and information centers.

A truly distributed DBMS should possess a two-phase commit capability, extensive recovery mechanisms, a sophisticated locking mechanism, horizontal and vertical fragmentation feature and a great deal more. And in order to support all of these features, the truly distributed DBMS needs an active, integrated, global data dictionary and directory.

Comprehension

When I asked the vendors directly whether these features are present in their products, a number of marketing representatives couldn't say whether or not these features were available. Forget about solutions — they didn't even understand the question.

How are we ever going to implement a distributed data base environment if we haven't mastered the communications network at all levels? And how are we going to manage a distributed data base environment if we haven't yet mastered the centralized version of the data base?

What type of organizational structure with data administration and data base administration is needed to make the distributed data base environment not only an acceptable but welcome

Continued on page 22

And it's up they go, into the wild Blue yonder

STANLEY GIBSON

Amid all the ballyhoo concerning the new IBM Personal System/2 microcomputers, I would like to assert that the most important aspect of these new machines has thus far eluded the army of analysts, journalists, users and camp followers who pounced on the IBM announcement much in the way a swarm of ants attacks a pile of peanut butter and jelly sandwiches.

The most important thing about the new micros is not the change from 5¼-in. to 3½-in. disk drives; not the 80386 chip; not the Micro Channel; not the multitasking, protected-mode operating system; not the Video Graphics Array; and not the DB2, SQL, ECF, APPC or 5250 features.

The most important feature is so important, and at the same time so obvious and so subtle, it is clear that Armonk's best brains spent many, many man-years contriving it.

What is it?

Well, all right, you've read this far, you're entitled to know. It's the IBM logo. That's right. The one in the upper left on the new video monitors.

You say it looks like the regular IBM logo — same initials in blue with lines through them? Look again. The new logo is at an *angle*.

So what? you yawn.

You are obviously ignoring the true significance of this sea change in corporate imagery.

Heretofore, the IBM logo appeared horizontally. The horizontal blue stripes offered the feeling of stability we naturally associate with things horizontal.

Now, that feeling of stability is gone. The new logo represents a coming of age for IBM; the injection of movement into previously static, conventional forms; a transition from Classic to Baroque in style.

In addition, the larger eco-

Continued on page 22

Gibson is a *Computerworld* senior writer.

MIPS cost

CONTINUED FROM PAGE 21

For the unaware DP manager, the news is definitely bad. He may find himself unable to explain to the corporate financial officer why the price per MIPS in a new system is higher than in the one he argued so vociferously to do away with.

But there are arguments he can use that will justify his paying more per MIPS. For example, using the airplane analogy I cited above, he can assert that there is just no other way to get from here to there without "upping" the operations cost per mile, or in his case, per MIPS.

If the financial officer is a micro nut who believes everything can be done using a network of desktop machines, the put-upon manager can find refuge in the following argument: You cannot haul a solid ton of steel by employing a thousand trucks with a total capacity of two pounds each.

These arguments are not the only two that will work; suffice it to say that it may be better never to introduce the financial manager to the concept of MIPS in the first place.

As for the future, I see little change in the MIPS cost-rise situation until the massive ISDNs begin to play a significant role in user facilities. The economies of scale these systems will eventually offer may ultimately serve to reverse the price per MIPS trend in today's user facilities.

When? Don't hold your breath.

What you need

CONTINUED FROM PAGE 21

solution to the problem of scattered data? How can the failure be pinpointed when it happens, and how can one best recover from it?

What type of data dictionary and directory capabilities are needed to support the type of intelligence needed to provide the single-system image that is the main theme of a distributed data base?

And when we say "distributed data base," do we mean distribution of data, of functions, of resources or of responsibilities — or maybe of guilt?

Where are IBM's stars — R-Star and Starburst? Features of R-Star and Starburst may show up in one of the releases of DB2, but the first priority for IBM is to make its data dictionary, called Catalog, active and integrated.

And what about referential integrity? Inclusion of that means distributed DB2 is at least two to three years in the distance. IBM is, of course, not eager to connect its hardware to Digital Equipment Corp. machines. However, a heterogeneous hardware environment seems to be the first choice of users in data integration.

Well-positioned products

In that area, products such as Informix from Relational Database Systems, Inc., Ingres, Oracle and Sybase from Sybase, Inc. are well positioned. But they are far from providing a complete distributed data base solution; what they offer is only remote data access.

Before getting dazzled by the ads, answer this question: Do you really need a distributed data base environment?

All you might need could be downloading data from the mainframe or departmental computer to micros. This capability is available today — but remember that downloading is time consuming. Everything has its price tag.

Wild Blue yonder

CONTINUED FROM PAGE 21

nomic context in which this new logo appears cannot easily be ignored. IBM, coming off several down years, needed a lift. Since we read left to right, the subtle implication is that things are turning up for IBM. At about a 45% angle, in fact. The angle of the logo connotes optimism and, at the same time, a break with past convention.

Just imagine if the logo headed down. That would convey declining revenue and low expectations for the new processors. "IBM falling off the cliff," or something like that. Instead, it's up, up and away into a brighter future.

There are other connotations as well. The new logo looks rather jaunty. It almost appears as if someone intentionally stuck it on the box off-kilter just to be different. Never mind that millions and millions will be produced, all of them identical. The message is individualism, in contrast to IBM's dull, dress-coded past.

Loyal, yet individual

This image ties into the print and broadcast ad campaign that features television's "M*A*S*H" characters — those irrepressible individuals who, while loyal to army and country, always thumbed their noses at authority with a harmless, mischievous subversion.

The image shows that IBM has taken a page out of Apple's book: The "1984" company humanizes and accepts people of all kinds.

So you see, the logo really *is* the most important feature of the new Personal System/2.

After the corporate PC manager's eyes have glazed over with talk of disk conversions and Operating System/2, the question will remain: Will he buy the computer?

Chances are, he will regain consciousness long enough to glance at the new logo, feel suddenly upbeat and write out a check for a huge sum, converting his megacorporation lock, stock and barrel to the new standard.

Everyone's talking about what they saw on the telephone.

They're all talking about the IBX® the first integrated voice/data switching system.

The IBX(Integrated Business Exchange) is proven, leading edge technology. It gives users a unified network for the sharing of hosts, voice and data devices, and applications. Already it's become the communications core for companies and organizations like PPG Industries, Monsanto, Union Bank, Air Products and Chemicals, Inc. and Lehigh University.

No matter what computer system you're using, no matter what information you need, the IBX can improve your communications network at every level.

For a customized demonstration, or for more information on the IBX and other InteCom products, call 1-800-INTE-800. In Texas, 214-727-9141, ext. 2661.

The Formula for Integration.

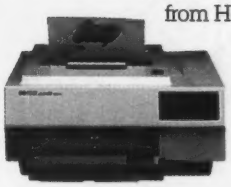
INTECOM INC.

A SUBSIDIARY OF WANG LABORATORIES

© 1987 InteCom Inc. A wholly-owned subsidiary of Wang Laboratories, Inc. 601 InteCom Drive, Allen, Texas 75002. The IBX is a registered trademark of InteCom Inc.

What can you expect from the new LaserJet Series II Printer?

Everything.



Because the LaserJet Series II Printer from Hewlett-Packard is the product of experience. It's a second generation printer from the company with the world's largest installed base of laser printers.

Whatever your company's needs, the LaserJet Series II will deliver the performance you expect, at up to 8 pages/minute.

Take a simple memo like the Soup letter we created with Microsoft Word. As you can see, you can print in a variety of formats and type styles with our wide selection of LaserJet fonts.

Or you can create a sophisticated combination of text and graphics. With additional plug-in memory, you can also produce full-page 300 dpi graphics, like our Nuts form shown below. To do this, we used HP's new ScanJet desktop scanner, Microsoft Windows and Pagemaker® from Aldus.

With support by more than 500 of the most popular software packages, the LaserJet Series II Printer can produce whatever type of business document you need. And LaserJet Series II works with all popular PCs so it can easily be integrated into your existing system.

In fact, only the price is unexpected —starting as low as $2495.*

For the authorized dealer nearest you, call us at 1 800 367-4772, Ext. 900A.

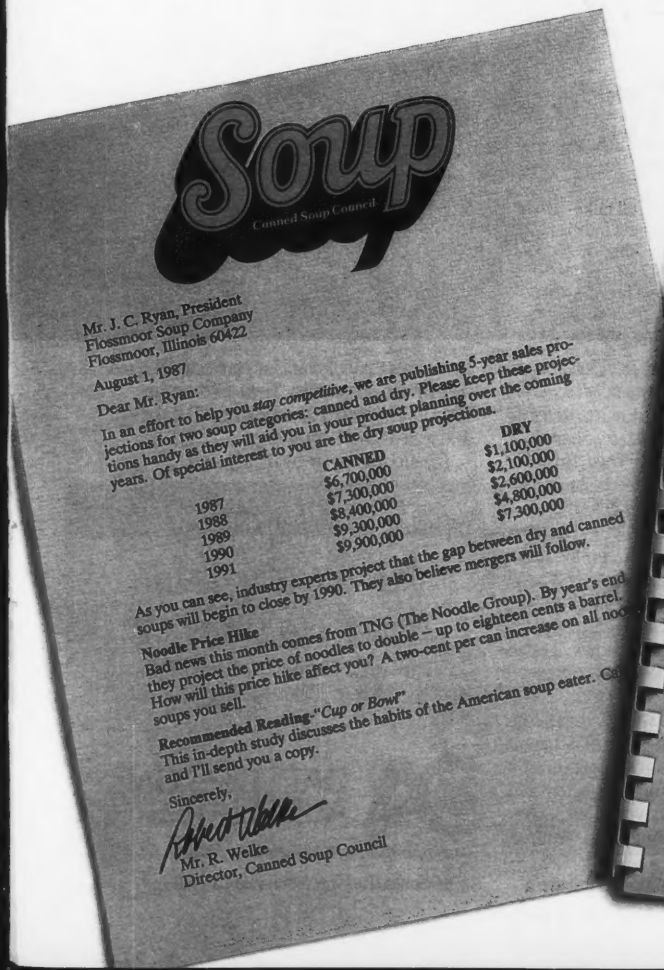
HEWLETT PACKARD

Business Computing Systems

Microsoft is a registered trademark of Microsoft Corp. Pagemaker is a U.S. registered trademark of Aldus Corporation

*Suggested U.S. list price. © 1987 Hewlett-Packard Co. PE12701

we never stop asking "What if..."



Soup

Canned Soup Council

Mr. J. C. Ryan, President
Flossmoor Soup Company
Flossmoor, Illinois 60422

August 1, 1987

Dear Mr. Ryan:

In an effort to help you *stay competitive*, we are publishing 5-year sales projections for two soup categories: canned and dry. Please keep these projections handy as they will aid you in your product planning over the coming years. Of special interest to you are the dry soup projections.

	CANNED	DRY
1987	$6,700,000	$1,100,000
1988	$7,300,000	$2,100,000
1989	$8,400,000	$2,600,000
1990	$9,300,000	$4,800,000
1991	$9,900,000	$7,300,000

As you can see, industry experts project that the gap between dry and canned soups will begin to close by 1990. They also believe mergers will follow.

Noodle Price Hike
Bad news this month comes from TNG (The Noodle Group). By year's end they project the price of noodles to double – up to eighteen cents a barrel. How will this price hike affect you? A two-cent per can increase on all noo soups you sell.

Recommended Reading–*"Cup or Bowl"*
This in-depth study discusses the habits of the American soup eater. Ca and I'll send you a copy.

Sincerely,

Mr. R. Welke
Director, Canned Soup Council

NUTS

Deluxe Assortment **Spring 1987**

Peanut
A tasty, unique assortment from plantations in Africa and Southeast Asia. And, yes, from Georgia too!

Brazil Nut
Exclusively from South America, these Brazils are fat, hard-shelled and delicious. They'll be much in demand.

Hazelnut
Cakes, cookies, ice cream, chocolate, salads. They'll never taste better than with this delicious French variety.

Almond
They're popular and they're versatile. Available whole, sliced or chopped, they're equally at home in Mom's favorite recipes.

Pecan
Another great favorite in the bakery. And our own superb pecans will satisfy even the most discriminating Southern tastes.

Walnut
Blond English Walnuts are just one of the many varieties available, in the best nutcracking tradition.

Chestnut
Superior varieties from our own plantations in Italy and France. All the best for more than seasonal consumption.

Pistachio
With an unusually subtle and delicate flavor, these perennial favorites will be perfect for either sweet or savory dishes.

Watch what happens next time you ask a mainframe software vendor for a complete customer list.

You may get a convincing song and dance, but underneath it's a different story. Behind those pat answers that software vendor is actually sweating and squirming.

Why don't they want you to see a complete list? Simple. They know that their size and name familiarity do not guarantee happiness. Many "single source" or "all-things-to-all-people" vendors have, at best, uneven quality across a multi-application product line. They know that their customer list may contain a good number of less-than-happy clients. It's difficult for these vendors to commit the human and monetary resources necessary to produce the type of superior product available from a firm that specializes in a single application area. A firm like Data Design.

Data Design develops mainframe financial applications software. Period. We understand all our users' requirements and are therefore able to provide the necessary support: over 40 percent of our support and installation staff are CPA's or have MBA's.

Data Design doesn't balk at giving prospective customers a *complete* customer list. That's because hundreds of FORTUNE 1000 companies have reaped exceptional results from our financial software systems. Alcoa, Gerber, Pillsbury, Sherwin-Williams, Merrill Lynch, Bankers' Trust, Bristol-Myers, Federal Express, Litton, Lloyd's Bank, The New York Times Company, Owens-Corning, Royal Business Machines, Warner-Lambert and hundreds more have opted for Data Design over other major vendors. Write for our complete customer list and ask *anyone* on it about our fast, trouble-free implementation; system flexibility and ease of use; in-depth training and responsive, knowledgeable support; *management level* people in customer service positions, and more.

You'll find that people who want financial software relief choose Data Design. Since 1973, nationally recognized independent software surveys have confirmed Data Design's unsurpassed record of user satisfaction—year after year. That's why we'll give you a complete customer list—and *they* won't.

So, if you're in the process of looking at mainframe financial software for your company, put Data Design on your list. Then tell the other vendors on it you're also looking at Data Design. And watch what happens.

Financial software by Data Design.
Simply the best.

GENERAL LEDGER
ACCOUNTS PAYABLE
PURCHASE ORDER CONTROL
FIXED ASSETS
PROJECT ACCOUNTING SYSTEM

Learn more about the best financial software available, call Betty Fulton toll-free at 800-556-5511 today.

DATA DESIGN ASSOCIATES

Excellence in financial software. By design.

1279 Oakmead Parkway, Sunnyvale, CA 94086

SOFT TALK

M. Haytham Matthews

Fear not the AI upgrade

Consider this scenario: Your company has decided to invest in the development of some expert systems. It starts up a department and brings in top-notch artificial intelligence programmers or consultants along with the most powerful (and expensive) AI development software and hardware on the market.

A couple of delivered systems and a few years later, you are in charge of updating and expanding the programs. Meanwhile, the original developers have moved on to other jobs, and the code, though presumably well written, is of such novelty that only another top-notch AI programmer who knows the implementation language could be trusted to modify it.

It is also unclear whether the software will be able to adequately handle the performance demands of a larger system. Furthermore, the syntax of recent versions of the implementation language may have changed, the vendor may have gone out of business or the language gone out of style.

If you are a systems manager involved with expert systems, this is the kind of scenario you try to avoid. The best way to do this is not to bail out of the

Continued on page 28

MAPICS weathers its critics

Despite attacks on functionality, planning package has many boosters

BY ROSEMARY HAMILTON
CW STAFF

In 1984, Terrell Corp. in Wilmington, Mass., now a division of the St. Paul, Minn.-based H. B. Fuller Co., discarded its 32-year-old manual bookkeeping and inventory system for an IBM Manufacturing Accounting and Production Information Control System (MAPICS) based on IBM System/36 hardware. Company executives have been singing the new system's praises ever since.

Many consultants, however, hum a different tune when it comes to MAPICS, claiming that it lags behind other manufacturing software from such vendors as Management Science America, Inc. (MSA) and Ask Computer Systems, Inc. "From my point of view, MAPICS is not the most functional," says Christopher Gray, president of Oliver Wight Software Research, Inc. in Essex Junction, Vt.

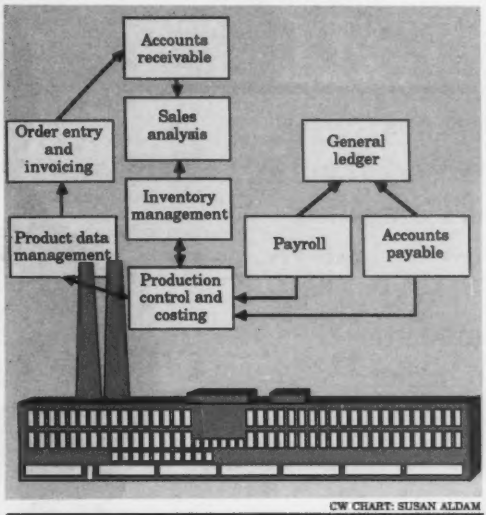
"MAPICS isn't as rich in functionality or as elegant in design as [software from] MSA or Ask," adds Gerald Chichester, chief executive officer of Focus Research Systems in West Hartford, Conn.

Nonetheless, thousands of manufacturers like the H. B. Fuller division in Wilmington have given the nod to MAPICS, making it the most widely installed manufacturing resource planning package today. According to International Data Corp., a market research firm based in Framingham, Mass., there were

Continued on page 28

H. B. Fuller's MAPICS system

Arrows depict flow of data between MAPICS modules



CW CHART: SUSAN ALDAM

Software AG links Adabas to Ada

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — As part of a long-term strategy to win more defense contracts, Software AG of North America, Inc. has developed an interface between the Ada programming language and the firm's Adabas data base management system.

The U.S. Department of Defense generally requires the use of Ada for critical military systems, so Software AG decided last year to find out whether Ada programs and Adabas could communicate effectively, according to Gary D. Bowers, manager of strategic programs for the Reston, Va.-based firm.

With help from researchers at TRW, Inc., a defense contractor in Colorado Springs, Software AG concluded that linkage was possible. "We found that there was nothing complicated about the matter at all. From Ada you can call Adabas as a subroutine, in effect, just as you can call Adabas from any other language," Bowers explained.

"But given the structural idiosyncrasies of Ada and the environment that it's invoked in,

Continued on page 28

Focus gets built-in worksheet

BY ALAN J. RYAN
CW STAFF

NEW YORK — Information Builders, Inc. has begun shipping Foccalc, an integrated spreadsheet that is built into Version 1.3 of its Focus fourth-generation language and data base management system for the Digital Equipment Corp. VAX.

The software is able to analyze data in a spreadsheet that resides in a Focus data base, DEC Records Management Services (RMS) files, DEC RDB tables or other data structures available to Focus, according to Melissa Webster, Information Builders' VAX division director.

Beta-test user Doug Critchett, principal systems analyst at DEC's Digital Information System Division in Atlanta, said he uses the software for internal consulting for the sales department instead of DEC's own product, Deccalc.

"Focus is the data base manager we use, so we decided to use Foccalc, which is easier to use and faster than Deccalc. It also gives us the continuity of using one product line," Critchett

Continued on page 27

Inside

- McCormack & Dodge creates site-licensing program for PC Link users. Page 27.
- The Geneva Group announces mail management programs for DEC PDP-11 computers. Page 32.
- Precision Visuals develops presentation-graphics system. Page 33.

INFORMIX UPDATE: A QUICK REPORT ON DB2.

Quick.

What's the fastest way to write a report from a DB2™ database?

Use a fourth generation report writer.

Presenting Report/DB2™ from Informix®.

It's a fourth-generation report writer and a perfect complement to QMF.™ It lets DB2 users and developers use a blend of non-procedural and procedural syntax to design and build complex reports quickly and easily.

For instance, instead of writing dozens of lines of COBOL, you can use simple non-procedural statements to generate page headings, footings, control breaks and the like.

While precise formatting and complex data manipulation is made possible by user-specified variables and procedural logic statements such as IF-THEN-ELSE, DO WHILE, and FOR.

SQL and MVS, but no TSO.

Report/DB2 uses exactly the same SQL as DB2 to access data. So it's a breeze to learn. It runs as a batch program in MVS environment and doesn't require TSO. What's more, it's built on an IBM® supplied interface. Which means it'll be compatible with all future releases of DB2.

Write on a PC, run on a mainframe.

Report/DB2 is based on the report writer in Informix-SQL, our own best-selling RDBMS for UNIX,™ MS™-DOS and VMS™. So instead of tying up your mainframe, you can use Informix-SQL and a PC to develop Report/DB2 reports. And then move them over to the mainframe.

Wait! We're not finished.

Report/DB2 is just the first in our family of fourth generation application development tools and utilities for DB2.

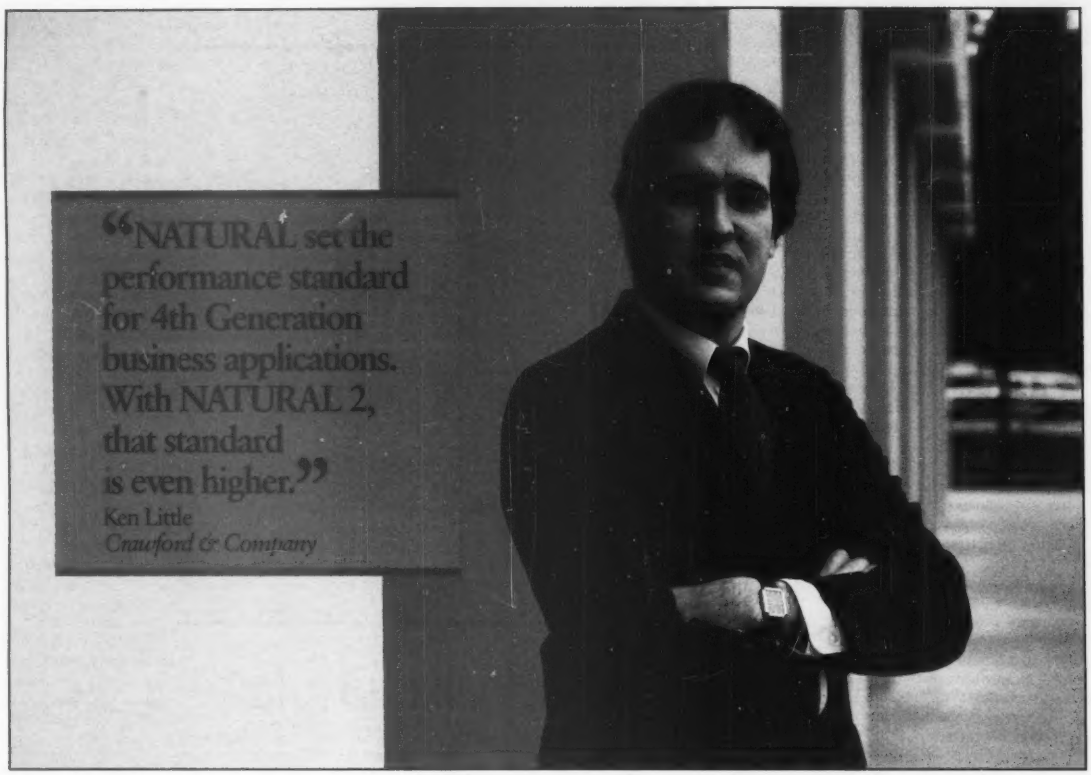
For details on Report/DB2, call or write Informix Software, Inc., 4100 Bohannon Drive, Menlo Park, CA 94025, 415/322-4100. And we'll give you a complete report, quickly.

INFORMIX

The RDBMS for people who know better.

Informix is a registered trademark and Report/DB2 is a trademark of Informix Software, Inc. Other names indicated by ® or TM are trademarks or tradenames of their respective manufacturers. © 1987, Informix Software, Inc.

NATURAL 2 performance draws another standard response.


"NATURAL set the performance standard for 4th Generation business applications. With NATURAL 2, that standard is even higher."
Ken Little
Crawford & Company

For applications developers like Ken Little of Crawford & Company, a risk management corporation based in Atlanta, Software AG's NATURAL 2 is setting new standards in performance and productivity.

With functionality beyond COBOL or any other language, NATURAL 2 saves money by saving application development time. Its ease of use saves on education and training.

And the performance of NATURAL 2 is such that Crawford & Company is converting other 4GL systems into NATURAL 2 applications. Because they'll use less resources and cost less to run.

Discover NATURAL 2. The Next Dimension in 4th Generation technology.

For a free NATURAL 2 presentation diskette, call: 1-800-843-9534
(In Virginia or Canada, call 703-860-5050)

SOFTWARE AG
PROGRAMMING BUSINESS SUCCESS

M&D unveils micro-to-mainframe site license

Responds to increased corporate need for PC tie-ins, claims cost-per-user reduction

BY JAMES A. MARTIN
CW STAFF

NATICK, Mass. — McCormack & Dodge Corp. recently announced a site-licensing program for large users of its Interactive PC Link micro-to-mainframe software.

The program carries a one-time fee of $75,000 and is said to cut software costs significantly per user, provide a standard micro-to-host interface throughout a corporation's operations and offer more convenient on-site software distribution. The one-time fee includes the first year of maintenance, training and support.

As the number of microcomputers proliferate within corporations, the need to tie those users into the mainframe for downloading or uploading has increased as well, according to Michael J. Levinger, senior marketing manager for McCormack & Dodge's applications tools business unit.

Demand on the rise

As a result, the demand for a site-licensing program to cut the costs of mainframe connectivity has been growing.

Interactive PC Link will continue to be available on a per-user basis for $1,100, with volume discounts still in effect, Levinger said. Companies with more than 70 microcomputer users in need of the mainframe link could cut their costs of mainframe connections with this program, he said.

The site-licensing program applies only to the microcomputer portion of Interactive PC Link. At present, there are more than 700 PC Link mainframe installations, compared with an installed base of 6,000 micros.

Bell Atlantic Network Services, Inc., located in Silver Spring, Md., was one of the earliest companies to sign up for a site license.

"We were faced with costs-per-terminal that were getting higher and higher, and this was an opportunity to make a one-time payment that would pay for itself in the first year," said William A. West, staff manager of Bell Atlantic's Human Resources Data Systems.

Boosting connectivity

As a result of the cost savings, Bell Atlantic will be able to bring micro-to-host connectivity to some 25 to 75 additional users this year, West said. This gives the MIS department and end users greater connectivity but does not drain the resources of the company's IBM 3084 Model Q mainframe, he added.

Costs aside, the chief advantage to site licensing for micro-to-mainframe links is "having a standard micro interface throughout the company," said Merv Adrian, chairman of the micro-to-mainframe special interest division of the New York Personal Computer Users Group.

"The ability to make multiple copies for distribution in the company gives MIS the confidence that there will be one interface," he added.

Interactive PC Link reportedly enables users to download and upload mainframe data in a real-time mode and in formats compatible with most microcomputer spreadsheet or data base applications.

Focus

CONTINUED FROM PAGE 25

said recently.

Spreadsheets created with Lotus Development Corp.'s 1-2-3 can be transferred to PC/Foccalc and uploaded into Foccalc to take advantage of the processing power of the VAX as well as to make those spreadsheets available to multiple users. "We don't have to take data from the VAX, download it to a personal computer and bring it up in Lotus's 1-2-3," Critchett explained.

The spreadsheet is said to permit users to automatically populate one or more spreadsheet cells with data residing in Focus data bases, RMS files, RDB tables or other data structures available to Focus. "We're the only integrated spreadsheet that can access data from mixed data sources live," Webster said.

Critchett said that while the software works very quickly, "we have reported some bugs." The most annoying problem for DEC, he said, is that the user can store the graphics for a spreadsheet so it can be printed on a plotter. It can only be stored in monochrome, however, and will print in monochrome, although the program allows the user to view the spreadsheet in color. "I would think if you're going to look at the screen in color, you'd want it to come out in color," he said.

An Information Builders spokesman said Foccalc can produce color graphs. One possible reason that Critchett was unable to print in color, he said, could be that some of the option settings had not been set.

Foccalc requires Focus Release 1.3 on VAX/VMS. It is available immediately and a one-time license fee ranges from $1,600 for Microvax and Vaxstations to $12,000 for the VAX 8800 and larger.

INTELLECT.
DP/MIS PRODUCTIVITY SOFTWARE FOR DB2 AND SQL/DS

Take another look. Now INTELLECT helps DP/MIS build and maintain DB2 or SQL/DS applications. INTELLECT delivers efficient application building and prototyping, generates expert SQL code, and virtually eliminates user request backlogs.

INTELLECT improves DP productivity for DB2 or SQL/DS with:

1) SQL code generation
2) Production system prototyping
3) Application modification and maintenance
4) SQL training facility
5) DB2 or SQL/DS catalog query and update
6) DB environment monitoring

For management, INTELLECT provides fast English access to complex databases. And INTELLECT's PC Link sends mainframe data directly to workstations in the format users want.

INTELLECT, the first successful AI software tool for IBM mainframes, is used by over 500 organizations worldwide. In addition to DB2 and SQL/DS, INTELLECT interfaces with FOCUS, ADABAS, Teradata's DBC/1012, and our own DFAM design.

Attend a free INTELLECT seminar and demonstration. Take the first step in dramatically improving *your* DB2 or SQL/DS productivity.

INTELLECT SEMINARS

Boston	June 16
Bridgeport	June 3
Chicago	June 18
Dallas	May 28
Detroit	June 11
Los Angeles	June 17
New York City	June 2
Philadelphia	June 9
San Francisco	June 10
Seattle	June 4

CALL (617) 890-8400

☐ I'll attend a free INTELLECT seminar
City _____ Date _____
I can't attend, but send a brochure _____
Name _____
Title _____
Company _____
Street _____
City _____
State _____ Zip _____
Telephone ( ) _____

INTELLECT is a trademark of Artificial Intelligence Corporation. DB2, SQL/DS, and IBM are registered trademarks of International Business Machines Corporation. ADABAS is a registered trademark of Software AG. DBC/1012 is a product of Teradata Corporation. FOCUS is a product of Information Builders, Incorporated.

AICorporation
USING AI TO DELIVER INFORMATION TO MANAGEMENT

Artificial Intelligence Corporation 100 Fifth Avenue, Waltham, MA 02254-9156 (617) 890-8400 Telex 989606

MAPICS

FROM PAGE 25

approximately 11,500 MAPICS packages installed as of 1986.

Consultants attribute MAPICS' market lead to IBM's reputation. "People don't buy software for rational reasons," Oliver Wight's Gray says. "Lots of people feel that IBM is a safe investment. Consequently, IBM doesn't have to have the best to be the market leader."

However, H. B. Fuller managers point to other reasons why they went with IBM's MAPICS, including the service and support they have received since purchasing it three years ago.

The company, which MIS director and marketing manager Henry Cooper says reaped approximately $5 million in revenue last year by the time of the acquisition, currently uses nine of the 16 MAPICS II modules. It originally installed MAPICS modules in the 1984 to 1985 time frame and then converted to the newer MAPICS II version a year ago. Cooper says an IBM systems engineer, whom he calls "a gem," has been at the site "holding our hand" each time a new module has been installed.

In 1984, the industrial adhesives maker found that "we'd lost track of where we were and what we had," says Arthur Cailler, plant manager.

"We were growing at 15% a year, and the paperwork was swamping us," Cooper says. "But we didn't want to add more paper shufflers. The obvious solution was to computerize."

Back to school

But this was to be no easy task, since "literally no one in the company had even touched a terminal," Cooper says. So Cailler took computer courses, and he and Cooper together began tallying a list of possible vendors. Initially, IBM was not on the list, Cooper says, because "we had a preconceived notion that they would be the hardest to deal with and the most expensive."

Cooper and Cailler say they were given mind-numbing presentations by both Digital Equipment Corp. and Wang Laboratories, Inc. "They used as much jargon as they could," Cooper says.

Additionally, these vendors were making pitches that included their hardware and other vendors' software. Cooper says the software vendors recommended were small outfits. The H. B. Fuller team concluded that these arrangements would require plenty of work on their part.

"The vendors were offering multivendor solutions, and to put ourselves in the hands of a four- to five-person organization didn't seem like a sound business decision. Besides, what they were offering seemed like it would require full-time expertise. We didn't want that," Cooper says.

In the midst of this, Cailler contacted a local IBM sales office. "They spoke English," Cooper says, in reference to H. B. Fuller's first meeting with IBM representatives.

"They offered MAPICS along with their hardware. No other vendor was offering us a complete system to do the job. It was just what we had been looking for," Cooper says.

Before MAPICS, the manual system ran two to three days behind schedule, according to Cailler. Employees typed invoices manually and stored inventory information on cards that were rarely up to date. When a customer placed an order, it was routine procedure for a sales agent to trot out to the warehouse to see if a particular product was in stock. And it was not unusual for that inventory to be snatched up by another salesman after the first one had checked the stock and committed it to his customer.

Inventory management

With MAPICS, the company has up-to-date inventory information that is managed by the MAPICS Inventory Management module. Data is automatically sent from the Order Entry and Invoicing module to Inventory Management to reflect changes in stock from orders that have been placed.

That data, in turn, is sent to Sales Analysis to keep track of what is being sold and by whom. This module can generate reports on a weekly, monthly, quarterly or yearly basis. The inventory data also goes to the Production Control and Costing module, which, among other things, generates necessary reports, such as warehouse pick lists, for production use.

Meanwhile, employees manually key data into the Accounts Payable module. It then is automatically sent to Production Control and Costing to update the user's data on what they are paying for materials used in production. Both the Accounts Payable and Accounts Receivable modules automatically send data to the General Ledger module, the main financial repository for the system.

"Now, we don't even type the name of a customer once," Cooper says. "When they call, we can check inventory and the customer's credit while they're on the phone. Then the order's placed, and that triggers the whole process," he says, referring to the automatic paperwork generation and inventory update.

Software AG

FROM PAGE 25

there are certain techniques that are preferred to make things simpler for the programmer," he said.

The researchers then developed a guide to show Ada programmers the most expeditious route for making a direct call to Adabas.

Bowers said that the direct-call method will be superceded when Software AG releases an extension to AdaSQL, its SQL interface to Adabas, that will support the Ada language. He said the Ada extension will be released in the third quarter of this year.

AdaSQL now provides an SQL interface from Cobol, Fortran and PL/1 languages to Adabas.

When the Ada extension is released, an Ada programmer also will be able to insert SQL statements within a program to perform data base manipulation. Through the AdaSQL preprocessor, the SQL commands are translated into direct calls to Adabas, he said.

Bowers said that adding Ada support to AdaSQL is important since the military, particularly the U.S. Army, is moving toward making SQL its standard data base query language.

Software AG said it has several other long-range projects aimed at meeting military software requirements.

These future projects include efforts to comply with the Defense Department's computer security criteria and to develop interfaces with the Defense Data Network, Bowers said.

AI upgrade

FROM PAGE 25

whole expert systems bag, but rather to move into it fortified by a heavy dose of long-term strategic thinking.

Although this is still relatively uncharted terrain, I believe the following principles suggest a workable approach to supporting expert systems of significant size.

- Deliver in an intermediate language. You may want to prototype applications in your development tool of choice. If so, consider the selection of the delivery language separately. You may decide to implement an efficient and well-known conventional language, such as C.

But beware, because the lack of built-in inferencing and declarative language constructs in conventional languages can make the delivery code more complex, difficult to modify and thus, harder to maintain. Instead, use an intermediate language that combines some of the benefits of both the modern AI tool and the conventional procedural language.

- Settle on a couple of suitable delivery languages. Choose fifth-generation languages that have good runtime performance, a good probability of continued existence, stable syntax and language features, a relatively short learning curve, ability to run on different classes of hardware (micros, minis and mainframes), a good interface to other languages (in case you need to use it to interface with a data base, a communications facility or I/O utility) and complementary features to the other delivery language(s) you may later select.

Languages that you might consider include C++, an object-oriented expansion to the C language. This language was developed by Bjarne Soustrup of AT&T Bell Laboratories and is marketed by both AT&T and Oasis Systems.

Another language is OPS5, one of the oldest forward-chaining, rule-based languages based on the fast RETE pattern-matching algorithm.

OPS5 was used for Digital Equipment Corp.'s now-famous "R1" expert system that configures VAX computers.

Consider also OPS83, an optimized revision of OPS5 that integrates a Pascal-like procedural language. Developed by the author of the RETE algorithm, it is marketed by Production Systems Technologies.

Finally, consider Prolog, a backward-chaining logic programming language that is also one of the oldest and most well-known.

- Support your delivery language choices. Develop in-house expertise, reusable utilities (such as interface tools) and a training program in support of your delivery language selections.

In sum, by building an infrastructure around a couple of well-chosen delivery vehicles, the maintenance of expert systems can be made less risky and more manageable.

Matthews is an associate of Information Resource Management Associates, Inc., serving as a consultant in business applications of artificial intelligence, in New York.

Network terminals, minis and PCs easily.

The latest breakthrough in data PABX.

Renting. The simple, no risk way to get started in data switching. MICOM's INSTANET6000 Series 20 is a small data PABX with big capability. And you can rent it for as low as $6.50 per channel per month.

The Series 20 can interconnect up to 250 computer ports and users in a single step. What's more, our Data Distributor eliminates cumbersome RS-232 cable by using existing wire pairs near your equipment.

To find out how to rent the INSTANET6000 Series 20, call us toll free.

Because when it comes to renting data PABX, we own the market.

1-800-MICOM-US

DATACOMM BY MICOM

"MICOM" and "INSTANET 6000" ®

MICOM Systems, Inc., 4100 Los Angeles Avenue, Simi Valley, CA 93063-3397

I Need To Know About It!

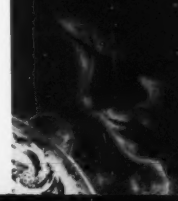
•

CA-Universe
It's everything everyone says a true relational DBMS should be.

•

( ) Please send me more information.
( ) Please arrange a free demonstration.
Name _____ Title _____
Company _____
Address _____
City _____ State ____ Zip ____
IBM Mainframe Model _____

What IBM Has Created
Computer Associates
Has Improved



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 216 ANDOVER, MA

Postage will be paid by addressee

COMPUTER ASSOCIATES™

Computer Associates International, Inc.
One Tech Drive
Andover, MA 01810-9986
Attn: Chris Andrews, Marketing Communications

CW 5/18

Relational DBMS

What IBM Has Created, Computer Associates Has Improved.

CA-UNIVERSE™, the complete, fully operational relational DBMS is here—with advantages important to you such as:

More powerful SQL
Stronger language and facilities—greatly improved while maintaining compatibility with the industry standard.

An active Data Dictionary
Multiplies your programmers' efficiency by maintaining all information relating to both the data base and applications development. Automatically updated to reflect all changes.

Referential Integrity
Central definition and automatic, efficient enforcement ensures business data integrity without requiring repetitive programming and maintenance efforts.

Data Independence
Our 3-schema architecture assures independence of the highest order greatly simplifying applications development.

Runs on VSE, VM, MVS
The data base and its applications are completely transparent to and independent from the operating system allowing them to run in any environment without modification.

VSAM Transparency
Facilitates migration and keeps things running without a hitch—or the need for program modifications.

Service and Support—the real thing
Included in the price are a full week's training on site, and assistance in developing your first application. Follow-up training, all you need, is available, too. That's the commitment of Computer Associates—the world's largest independent software company—bringing you the most comprehensive service and support in the industry!

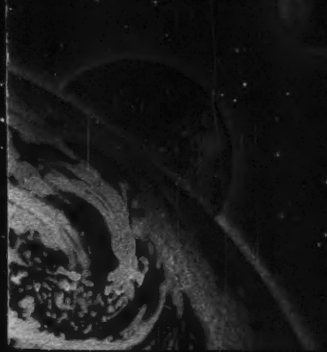
We invite your comparison. We offer an excellent solution based upon the efficiency of our design, the capabilities of our user and programmer tools, and the strength of our service and support—and we'd like to prove it. Call or write today and ask us for a demonstration.

CA-UNIVERSE is a trademark of Computer Associates International, Inc. IBM is a registered trademark of International Business Machines Corporation.
1987 Computer Associates International, Inc.

1-800-343-4133
(In Massachusetts 1-800-322-0491)

COMPUTER ASSOCIATES™
Software superior by design.

One Tech Drive, Andover, MA 01810-2497



Digital has it now.

The one thing departments do with consistency is change. Therefore, the most challenging problem in departmental computing is how to meet needs you can't always predict.

Digital understands. Our solution is a single architecture that is so flexible, it can satisfy your department's computing performance demands from the desktop to the data center. Our VAX™ systems all use the same huge range of applications, the same files, the same friendly commands. Throughout the department, VAX systems, storage devices and applications can be cost-effectively added or reallocated without disrupting users. Systems can even

One Architecture. A consistent approach to computing for all your department's changing needs.

be clustered for greater power, capacity and redundancy. Transparent communications built on the same architecture let you tie our computers to each other and to multi-vendor environments. And because of our superior networking technology, you can also connect peer-to-peer in both local and wide area networks.

Best of all, with one architecture you're always in control–no matter how things change. Call your local Digital sales office. Or write: Digital Equipment Corporation, 200 Baker Ave., West Concord, MA 01742.

digital™

© Digital Equipment Corporation 1987. The Digital logo and VAX are trademarks of Digital Equipment Corporation.

NEW PRODUCTS

Systems software

Unilog, Inc. has introduced **CICS Memo**, text-management software for DOS environments.

CICS Memo was designed for document entry, update and retrieval. It offers organizational and search capabilities by logical operators, key words and miscellaneous text strings, dates, numbers or quantities.

It provides on-line availability of updated text records, features a built-in word processor and can zoom in and out of synthetic, semisynthetic and full-index displays, the vendor said.

Other features include on-line printing while work continues at the terminal and a direct method of access with a response time of less than one second, according to the vendor.

CICS Memo costs $9,500 for IBM DOS, with an annual renewal fee of $1,430.

It costs $12,300 for MVS, with an annual renewal fee of $1,850.

Unilog, 4111-F Rose Lake Drive, Charlotte, N.C. 28217.

The Geneva Group has announced the **Mail Management System** (MMS) of mail management programs for Digital Equipment Corp. PDP-11 computers that were developed by Hal Systems Corp. in Seattle.

MMS is said to feature form letter and label printing programs as well as a series of list-preparation utilities that allow users to read mailing lists from non-DEC tapes, standardize addresses, eliminate duplicate records, assign carrier routes and presort records.

MMS can process any flat or hierarchical ASCII file format.

The seven modules that make up the series are priced as follows: Read Non-DEC Tape, $400; Standardize Addresses, $300; Check Duplicate Records, $400; Assign Carrier Routes, $2,500; Presort, $500; Letter Printing, $800; and Label Printing, $600.

The complete package is priced at $4,600.

The Geneva Group, P.O. Box 58998, Seattle, Wash. 98188.

Sherpa Corp. has added a version to its **Design Management System** (DMS) that is said to be capable of residing on multiple Digital Equipment Corp. VAX/VMS computers in a Decnet environment.

The Sherpa DA-DMS software allows for unlimited expansion of engineering management control over a distributed network of VAX computers, according to the vendor.

The product reportedly has the ability to automate the management of design files by tracking and overseeing associated design data throughout design processes and automates all system communications and file-routing functions between VAXs.

A minimally configured DA-DMS encompassing one host on a DEC VAX, one remote on a DEC Microvax and network servers costs $70,500.

Sherpa, 611 River Oaks Pkwy., San Jose, Calif. 95134.

Louis A. Wright & Associates, Inc. has added modules to its **Wright Access** manufacturing planning and control software system.

New modules include order processing, invoicing, shipping, sales analysis and inventory-control functions, according to the vendor.

The system also reportedly includes job costing, estimating, quoting, purchasing, resource scheduling and complete accounting.

The Wright Access software system runs on IBM minicomputers.

Modules can be purchased individually or as a system.

Prices for Wright Access start at $3,000 per module.

Louis A. Wright, 44567 Pinetree Drive, Plymouth, Mich. 48170.

Applications packages

Applied Expert Systems, Inc. has announced **Apex Client Profiling**, an expert system that was designed for financial institutions.

The expert system is said to run on Digital Equipment Corp. VAX systems. It also reportedly accommodates remote data entry from an IBM Personal Computer.

According to the vendor, the Microvax II can produce up to 12,000 client reports per year.

Apex Client Profiling is said to take into account expressed priorities.

The product is also said to develop specific recommendations with clear implementation strategies.

Client Profiling is priced at $150,000 including customization and support.

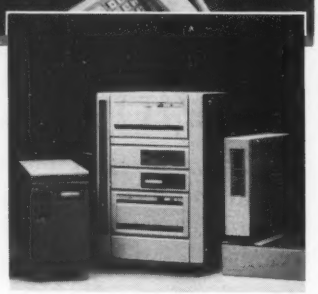
An additional $150,000 covers the annual software license.

Applied Expert Systems, 5 Cambridge Center, Cambridge, Mass. 02142.

Hewlett-Packard Co. has added an interactive software program for calculating and controlling the cost of manufactured products, called **HP Standard Cost Management**.

Features include fill-in-the blanks customization and on-line costing for selected parts of a product, a single product or

Buy Digital's MicroVAX II from MTI and get more than a powerful cpu...



THE MICROVAX II FAMILY

Get MTI Technical Expertise.

Digital's MicroVAX II is a powerful, 32-bit, cost effective microcomputer configured with the extended Q-bus. Software compatible with larger VAX systems, the MicroVAX II can operate in any normal office environment with a standard 15 amp outlet.

MTI has been an authorized Digital distributor for over ten years and has a staff of Digital-trained applications engineers ready to help you find the best combination of Digital products to get the most out of the MicroVAX II. Buy, lease, or rent it at great prices. Call MTI today.

MTI SYSTEMS CORP.
A SUBSIDIARY OF DUCOMMUN INCORPORATED

Computer & Data Communications Equipment
Sales / Leasing / Service / Systems Integration

New York: 212/226-2337, 516/621-6200, 518/449-5959
New Jersey: 201/227-5552
Ohio: 216/464-6688

MicroVAX is a trademark of Digital Equipment Corporation.

Authorized Distributor

an entire product line, according to the vendor.

The program also allows users to perform "what-if" scenarios.

The program can be used as a stand-alone or as part of HP Manufacturing Management II, a manufacturing resource-planning solution.

It runs on HP 3000 business computers.

HP Standard Cost Management is priced at $15,000.

HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Precision Visuals, Inc. has announced **Picsure Plus Version 2.5**, a presentation-graphics system said to allow users to create and modify charts without learning a programming language.

Users can reportedly interact with the program by using a set of menus, by entering commands or by writing custom interfaces with a built-in programmng language.

Users are provided the ability to access any hard copy device in the system without leaving the chart building session, the vendor said.

Picsure Plus Version 2.5 is said to run on any computer with a 32-bit or larger word size, a Fortran 77 compiler and the ASCII or EBCDIC character set.

Prices start at $6,600.

Precision Visuals, 6260 Lookout Road, Boulder, Colo. 80301.

Utilities

Sterling Software, Inc.'s Dylakor Division has released a version of its **Dyl-Online CICS, Release 2.0** for CICS/MVS and CICS/VSE environments.

Release 2.0 of the ad hoc information retrieval tool no longer requires use of the CICS signon table.

Signon and password protection are provided as an integral part of the package, according to the vendor.

Other enhancements, including user profiles, are maintained on-line, and the first six characters of the job name for a given user may be customized to meet shop standards.

Up to nine subdirectories, each of which may contain up to 40 members, are permitted, and the maximum size of the request master file has reportedly been increased.

Release 2.0 is priced from $6,000 to $26,000.

Sterling Software, Dylakor Division, P.O. Box 2210, 9340 Owensmouth Ave., Chatsworth, Calif. 91313.

Computer Associates International, Inc. has announced **Release 1.1** of **CA-Accuchek**, its application testing and maintenance software tool for IBM mainframes.

CA-Accuchek Release 1.1 is said to compare files, records and fields within records to verify output after changes have been made to programs or systems.

The product can also pinpoint mismatches in reports, the vendor said.

Other features reportedly include the ability to dump records, printing either selected fields or full records in character or hexidecimal format; create test files; and process VSAM and ISAM files.

CA-Accuchek is priced at $8,000.

Computer Associates, 711 Stewart Ave., Garden City, N.Y. 11530.

Pansophic Systems, Inc. has announced the **D-Pict to Starburst Plus link** between its mainframe and minicomputer-based D-Pict graphics software products and its Starburst Plus turnkey microcomputer graphics system.

Graphics created using the nine D-Pict VGL-based products can be processed by the IBM Personal Computer AT-based Starburst Plus system for manipulation, artistic embellishments and output, according to the vendor.

The link is available at no extra charge for D-Pict products running under VMS 4.0 on the Digital Equipment Corp. VAX 8800 series, 8600 series, 8500 series, 8300 series, 8200 series, the 11/730, 11/725 and the Microvax II.

The single-CPU costs for the DEC versions of D-Pict range from $3,800 to $26,300.

Starburst Plus is priced at $32,500.

Pansophic Systems, 709 Enterprise Drive, Oak Brook, Ill. 60521.

Thorn EMI Computer Software, Inc. has introduced a fully integrated **interface** between its FCS decision-support software package and IBM's SQL relational data base manager.

The interface is said to allow for data and text to be read from SQL into the FCS work area and manipulated using FCS commands as well as SQL commands.

The data can be used to update the SQL records or may be stored in FCS, according to the vendor.

Features of the product are said to include pop-up menus and on-line Help.

The interface is priced at $8,500.

Thorn EMI Computer Software, 285 Mill Road, Chelmsford, Mass. 01824.

CDB Software, Inc. has announced **DB2-SMU**, a software product for use with IBM DB2 data bases.

DB2-SMU reportedly has the capability to analyze DB2 data sets, identifying data inconsistencies and errors.

According to the vendor, it then prepares summary and detail reports.

DB2-SMU reportedly has the ability to provide analysis, performance-tuning and productivity functions.

The product also functions as a DB2 data base internal education tool.

DB2-SMU costs $15,000. The annual maintenance fee is 15% of the current perpetual license price.

CDB Software, P.O. Box 771624, Houston, Texas 77215.

Release 1.4 of **Journal Processing Utility** (JPU) has been announced by **Softsystems, Inc.**

JPU is said to have the capability of recovering lost data for VSAM files and DL/1 data bases that are operating within a CICS environment under IBM's DOS/VSE, OS/VS1, MVS or MVS/XA mainframes.

Release 1.4 of JPU offers batch journaling and hot-file backup processing, according to the vendor.

Other features of the tool reportedly include forward recovery as well as backward-recovery backout.

Softsystems said the product additionally includes such features as reporting, print, copy and user exit facilities.

JPU is priced at $6,000 for DOS sites and $8,000 for OS sites.

Softsystems, 311 Mallick Tower, One Summit Ave., Fort Worth, Texas 76102.

Development tools

Datem Ltd. has announced its **DDCMVAX** support package of Bitbus development tools for the Digital Equipment Corp. IBQ01 Bitbus interface.

The package provides a set of support services for developing distributed-control networks based on the Intel Corp. Bitbus interface standard, the vendor said.

The tools include a general-purpose network utility package, an Intel 8044 assembler, an 8044 C compiler, an autoload utility package and a full-screen terminal emulator, according to the vendor.

The DDCMVAX package is priced at $2,995.

Datem, 148 Colonnade Road, Nepean, Ont., Canada K2E-7R4.

HYDRA®

Direct Channel Attached Protocol Converter Controller

•Terminal Emulation • Printer Emulation • Communications •
Our Customers Agree that HYDRA is *the* Solution.

Ease of Use
"Every application we looked to use HYDRA for has been accomplished. We are amazed with the simplicity and flexibility that HYDRA offers. We use HYDRA to drive laser printers as 3211 printers, support several types of ASCII terminals, and for PC to Host file transfer. For both local and remote applications HYDRA has been a tremendous help. We didn't even need a system programmer to set everything up."

Buddy Allee
Data Processing Manager
Tower Life Insurance, Co.

Communications
"As Hawaii's premier inter-Island carrier it is vital for the information we transmit to reach its destination. This is why we chose the HYDRA. It enables us to use local and remote (including mainland) PC's to communicate data to/from our mainframe. We also download files containing member lists into PC's for preparation of personalized letters, for example, to our frequent fliers. We have been very impressed with HYDRA's performance!"

Natalie N. Playdon
Director-Computer Services
Aloha Airlines

Terminal Emulation
"HYDRA has been extremely effective in PC and switched access to the Host. Our students can use their PCs as a work station or a 3270-type terminal connected to the HYDRA. We have over 250 devices supported on 3 systems by HYDRAs which eliminated the need for additional dedicated controllers. We found HYDRA costs less than we were spending on our previous protocol converter each year in maintenance alone."

Kelly McDonald
Technical Support Manager
Brigham Young University

HYDRA

Dial-In Support
"HYDRA allows students and programmers off campus to dial-in and work on projects. With support for such a wide variety of devices HYDRA enables virtually any ASCII terminal or PC to talk to our system. This is ideal for us as we can cater for students no matter what terminal or PC they may be using. We are thrilled with the performance of the HYDRA and would definitely recommend it as a strong asset for any data processing center."

Dwight Ayle, Sr. Instruction Programmer Analyst
Mt. San Antonio College

1403 Printer Emulation
"HYDRA's 1403 printer emulation has been a real money saver for us. We use Printronix 600 LPM printers defined as 1403's for jobs that would normally require expensive laser printers. HYDRA's versatility made it possible for us to generate our bar coded inventory tags. Our customers and programmers also appreciate HYDRA's dial-in capabilities."

Steve Brown
Data Processing Director
R.M.S.A.

3211 Printer Emulation
"With HYDRA's 3211 printer emulation support, our customer reps can print sample documents on their matrix printers and review them before we begin a major production run. We had a definite need, and HYDRA was the solution to our problem. What really helped was not needing to go through a front-end processor or additional controllers. HYDRA channel attaches, which made things very simple for us."

Jim Mountain
System Consultant
Mailing Services of Pittsburgh

Their Solution Can be Your Solution!

Call Today! **800-55-HYDRA** In California (714) 770-2263

For full details and your closest HYDRA dealer

JDS MICROPROCESSING

IF YOU'RE TALKING 9370

YOU'RE TALKING VMCENTER II

The advent of the IBM 9370 presents a whole new opportunity for end users in distributed environments. And a whole new challenge for the professionals in the Data Center.

Meeting that challenge calls for the very best help you can get.

It's called VMCENTER II.

VMCENTER II is VM Software's comprehensive answer to the management needs of the 9370 environment. In one powerful package, VMCENTER II includes everything you'll need to serve end users better than ever—while maintaining strong central control.

THE ACCESS USERS NEED. THE CONTROL YOU NEED.

VMCENTER II speeds end-user access without compromising security. Automates DASD management for optimum performance at minimal cost. Monitors system usage for workload balancing and project accounting. Even helps users look ahead automatically to plan for future needs.

Best of all, it does all this with a minimum of time and attention from data processing professionals. With VMCENTER II on your side, you'll be able to concentrate on strategic tasks—knowing the details are under control.

A PROVEN APPROACH. A DEPENDABLE SOURCE.

If this capability sounds familiar, it should. VMCENTER II is based on the best of all possible models: VMCENTER itself—the world's leading Data Center management system for mainframe VM.

In designing VMCENTER II, we started with the manifold strengths of the original VMCENTER. Then added a host of new features specifically designed for departmental computing environments ranging from automated offices to executive workstations. And we finished by tying it all together in an efficient, integrated package that's light-years ahead of any piecemeal alternatives you're likely to see.

Not that any of this should be a surprise. It's what people have come to expect from VM Software. Which is why we're a fixture in the world's most important VM environments—including 42 of the *Fortune* 50. And why we're the vendor best qualified to help bring VM to the department-level users who need it.

No wonder so many of America's industry leaders are already making VMCENTER II the cornerstone of their 9370 implementation strategy. Partly because they know they can count on VM Software for the long term.

VMCENTER II and the 9370. Two great products. Two great vendors. One fantastic combination.

For more information call or write today.

VM SOFTWARE INC.

VM Software, Inc.
1800 Alexander Bell Drive
Reston, Virginia 22091

(800) 562-7100
(703) 264-8000

SMALL TALK

William Zachmann

Multispeed a tip-top laptop

The NEC Corp. Multispeed laptop computer is a good example of why the Reagan administration's recent punitive tariffs against Japan are likely to end up punishing American consumers unless they are lifted soon. One of the newest entries into the market, the Multispeed is a good example of the benefits users receive from intense competition among vendors in open markets.

Unfortunately, the U.S. Department of Commerce's trumped-up charges against Japanese vendors for selling semiconductors at competitive prices in the world market has been used as an excuse to slap idiotic tariffs on products like the Multispeed. Fortunately, there are enough products in the pipeline to ensure adequate supply for now. Nonetheless, I'd suggest that anyone who wants a NEC Multispeed run out and buy one while the $1,995 list price is still unaffected by the tariffs.

Having logged quite a few hours on various laptop systems, I'm getting to be quite a con-

Continued on page 37

Marking the end of the Rainbow

Vaxmate push, competition, poor marketing help kill 5-year-old DEC PC

BY DAVID BRIGHT
CW STAFF

When Digital Equipment Corp. introduced the Rainbow 100 personal computer five years ago this month, industry observers considered the machine a worthy competitor to the IBM Personal Computer. It was well engineered and ran a hybrid of Digital Research, Inc.'s industry-standard CP/M-80 8-bit operating system and the 16-bit CP/M-86. The Rainbow later offered a version of Microsoft Corp.'s MS-DOS that was incompatible with other vendors'.

Now the Rainbow has been killed in favor of DEC's Vaxmate, a more powerful IBM PC AT-compatible system designed with VAX connectivity in mind. Last fall, DEC informed a Digital Equipment Computer Users Society group that the Rainbow was "a mature product." And in February, DEC told its sales representatives to begin taking their final orders.

To be sure, there are a lot of enthusiastic Rainbow users out there, many of whom claim that the machine — with built-in features such as DEC VT 102 terminal emulation and high-resolution graphics — was one of the best engineered personal computer systems on the market. "The quality was far superior to anything else out there," maintains Steven Grow, supervisor of office information systems operations at Consolidated Freightways, Inc. in Portland, Ore. And John Rose, who manages DEC's personal computer systems group, says that the Rainbow has been a "positive experience" for the company.

Nevertheless, the fact remains that the IBM PC family has outsold the Rainbow line by a

Continued on page 39

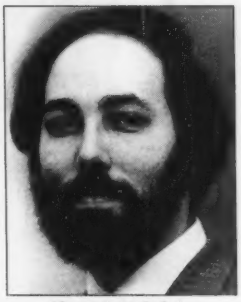
Phoenix chief: to clone or not to clone?

This is the first of a two-part series

Neil Colvin, chief executive officer and chief scientist at Phoenix Technologies Ltd., founded the custom engineering firm in 1979. Over the last several years, the company has made its reputation providing ROM BIOS products compatible with IBM's Personal Computer series to several major systems manufacturers.

Before founding Phoenix, Colvin helped form Technical Design Labs, one of the first five microcomputer companies, in 1975. He was also a cofounder of Xitan, which developed various operating system products and programming tools. Colvin graduated with an engineering degree from MIT in 1975.

Colvin, 37, recently took time to talk with *Computerworld* Senior Editor Ed Scannell about IBM's recently announced Personal System/2 and the issue of cloning it.



Phoenix's Colvin

How difficult will it be to clone IBM's Micro Channel?

The people at Chips & Technologies, [Inc.,] for instance, have told us there is no technical problem with cloning the Micro Channel.

In fact, they think that is easy. Chips expects to have sample chip sets for both a board and for a main motherboard by the fall — and introduction by [next] January.

The only questions people raise are legal ones. They [Chips & Technologies] have done research on it, and so far they haven't found anything that

Continued on page 36

New heart for Dayflo and CEO

BY DOUGLAS BARNEY
CW STAFF

IRVINE, Calif. — In 1986, Robert Gilchrist, chairman of Dayflo Software Corp., had a heart transplant operation.

The Scotland-born Gilchrist was given little chance of survival by his doctors. At the time, his company was equally imperiled. Today, the 48-year-old Gilchrist sports the heart of 20-year-old woman, and his company has a new life.

When Dayflo introduced its free-form text-based data base in 1984, the future looked promising. The firm had more than $10 million in venture capital, more than 50 employees and a bold advertising campaign that included a floppy disk wedged into a facsimile of a human brain.

But the firm's original product, Dayflo, was a concept difficult for the market to grasp. "It was very heady times for us, as we brought the technology

Continued on page 39

Inside

- Kay Elemetrics offers a desktop that can capture, play back and analyze speech. Page 40.
- Expertelligence releases an artificial programming language for IBM PCs and compatibles. Page 40.

► IBM 3270 and System /34/36/38 Users:

Our Printers Solve Problems That IBM Printers Can't.

► Since 1975, we have manufactured IBM 3270 and S/3X plug-compatible printers for over 1,000 organizations worldwide. Why do users prefer ISI? Mainly, because our printers have problem-solving capabilities not available with corresponding IBM models.

For example, with ISI printers, you can:

- ► Print continuous, multi-part forms without costly waste.
- ► Print bar codes and oversize label characters.
- ► Print up to 8 pages of letter-quality text per minute.
- ► Print IBM Programmed Symbols graphics in up to 7 colors.

Added features and all, our printers cost 15-30% less than their IBM counterparts.

Select from desktop dot matrix, laser, and letter-quality impact models, as well as floor-standing line printers. All provide plug-for-plug compatibility. Plus they're shop-floor durable, and feature onsite service nationwide.

For our free brochure, call **1-800-544-4072** (in Michigan, 313/769-5900). Or write.

Interface Systems, Inc.
5855 Interface Drive, Ann Arbor, MI 48103
Telex: 810-223-6058

► Our dual-hopper Laser8 quietly produces 8 self-collated pages of letter-quality text per minute. It's available in a 3270-compatible model, which emulates the IBM 3287 and 5210, and an S/3X model, emulating the IBM 5256 and 5219.

Phoenix chief

FROM PAGE 35

would keep them from doing it. But there are patents pending, so who knows?

It will be almost two years before the U.S. Patent Office will make IBM's patent applications public. Will IBM be allowed to tie up the market for that long?
They can't tie it up at all. A patent pending has no effect.

So if you clone the bus you can't be sued?
They can't sue you. If their patent stands, they can come and ask you to pay some sort of license fee. Part of this issue is that IBM has licensed two major portions of the Micro Channel from other people already: the self-configuration and "handshaking" [portions]. So in one sense, the Micro Channel isn't entirely IBM's anyway.

What sort of engineering job did IBM do with the Micro Channel?
Well, it solves a lot of problems of the old channel. It solves some of the timing problems, more formally specifies the bus for the first time and solves a lot of the emission problems the FCC was getting upset about.

But the point many people make is that IBM could have gotten a better bus design and maintained compatibility. IBM just chose to throw the hundreds of thousands of peripheral cards and add-on boards that are in-field in the wastebasket, effectively. And that has a lot of people upset. Remember, the Micro Channel is not central to the PS/2 from the point of view of the software.

The Micro Channel is simply a hardware-to-hardware connection methodology for boards. So it is possible to create a PS/2 functional clone that has no Micro Channel in it. You get the feeling from [Compaq Computer Corp. President] Rod Canion's statements that that is what Compaq plans to do initially. And if people do clone the Micro Channel, it is very unlikely we will see a clone that only has a Micro Channel in it.

Can that be done easily?
If you have chip-set support for the Micro Channel and chip-set support for the regular bus, both can be put in the same machine.

There won't be any bottleneck in going from one bus to another?
No. In fact, a number of companies have already announced products where they sell you an expansion box for the existing channel that will run all the boards. The expansion box plugs into the Micro Channel and then converts the Micro Channel into the old bus, which is an electrical problem — it is not a big technological problem.

We had heard rumors that IBM had prototypes of the Personal Systems that contained the old bus.
There were heavy rumors that IBM produced both old-bus and new-bus versions of all the [PS/2] machines. Who knows if that is true, but it would be reasonable to assume they did.

> "IBM chose to throw hundreds of thousands of peripheral cards and add-on boards that are in-field in the wastebasket."
>
> NEIL COLVIN
> PHOENIX TECHNOLOGIES LTD.

There have been discussions among some manufacturers of producing machines that have that [an alternative] bus in it, which has the same performance characteristics as the Micro Channel and still gives you backward compatibility. I think some people will take the chance of cloning it totally, some will come out with equivalent machines with the old bus and some will try to mix the two buses.

Secure From Any And Every Kind
Of Power Disturbance.
The World's Smallest Big Idea In PC
Our PC Protection Center combines on-line UPS, line regulation, and surge protection.
Of course, you'd expect this from Liebert–we support thousands of mainframes with computer grade power.
What you might not expect, though, is that this triple protection comes in a 2.3" high package that slides neatly under a PC monitor... a nifty trick by any measure. We have a patent pending on the technology that makes it possible.
The PC-ET has five switched outlets. All are conditioned. Three provide UPS protection: on-line protection rather than standby, so switchover time to battery is a nice round 0.
The Liebert PC Protection Center will support any PC (Apple, IBM, or compatible) up to and including a fully
Liebert

Multispeed

FROM PAGE 35

noisseur. And the NEC Multispeed matches or exceeds the best that I have seen from other laptop vendors.

In the first place, the keyboard design is first-rate. NEC has done a good job of providing what is close to a full-size IBM Personal Computer-style keyboard in a laptop package. The 10 function keys are on the left as in the original IBM PC XT and AT configuration, and keyboard templates fit perfectly.

And unlike many other laptops (including IBM's), the NEC Multispeed offers a true numeric/cursor control keypad. The return key is larger than it is on the IBM PC and XT keyboards but smaller than the AT's — both old and new style.

Keyboard enhancements include LED-lit Num Lock and Caps Lock keys. In addition, there are two extra keys: Pop Up and Help. These are related to another unique feature of the NEC Multispeed: It comes with a nice package of bundled applications software.

The Multispeed is one of the first of the full-function IBM-compatible two-disk systems to include the kind of built-in software that has long characterized the Tandy Corp. 100 and 200 products. Along with the Microsoft Corp. MS-DOS 3.2 that comes with the Multispeed, you also get Notepad, Filer, Outliner, Dialer and Telcom programs. These provide a text editor, a basic file manager, an outliner, a phone dialer and a communications program.

In addition, the Multispeed comes with a built-in memory-resident utility that provides what is in effect a memory-resident hot-key menu selection for the six utility applications. A Setup utility is also included, which includes a handy facility for creating a random-access memory (RAM) disk.

One of the best features of the RAM disk is that unlike on a normal desktop system, the RAM disk on the Multispeed retains its data when the system is off. You therefore get, in effect, up to 126K bytes of user-programmable read-only memory with the Multispeed.

Built-in programs

The special NEC Multispeed utility applications are not simply programs on the MS-DOS distribution disk. They are built into the system. Therefore, the .COM files for starting them on the disk are only about 135 bytes long. This is extremely helpful in making disk space available for other applications or data files.

The supertwist LCD is clear and easy to read for a screen of its type, although I did find the relatively slow rate at which the screen responds a little bit disconcerting until I got used to it. As the Multispeed name implies, the system's NEC V-30 Intel Corp. 8086-workalike microprocessor can run either at the 4.77 MHz of the IBM PC and XT or at 9.52 MHz.

Compatibility appears to be extremely good. The NEC Multispeed works well with a variety of programs. But the special NEC Multispeed utility applications will work only with the NEC version of MS-DOS.

Another useful feature is the detachable LCD supertwist display. An easily installed and removed nickel-cadmium battery pack and a built-in connector of external disks, as well as the standard parallel port, serial port and display connector, are further examples of the system's well-conceived design.

The bottom line is that NEC has done a first-rate job of building what is, in many ways, a significantly better mouse trap.

Zachmann is vice-president of research at International Data Corp.

Ditto.

Data Protection...New From Liebert.

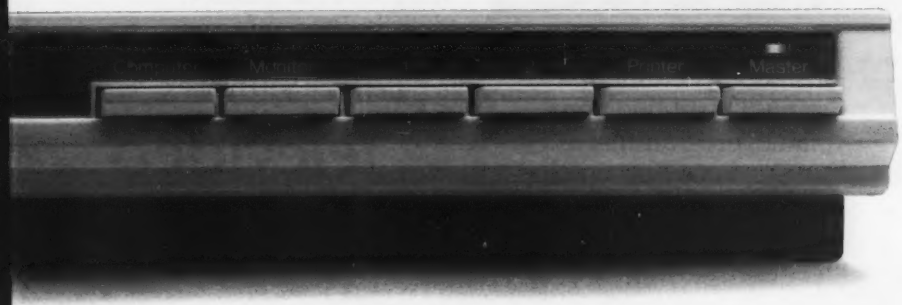
configured AT... or an IBM Personal System/2 Model 60. Its size and price make it the first practical one-step solution you can offer PC users in your organization.

A solution that's backed by Liebert quality, Liebert technology... and the largest dedicated power service group in the world.

So get in touch. We'll be happy to send you complete details and specs... or better yet, to set up a demo at your convenience. Just give us a call at 614/888-0246.

The Acknowledged Power In Data Protection.

Liebert



DB2 or SQL/DS PROJECTS?

Call the

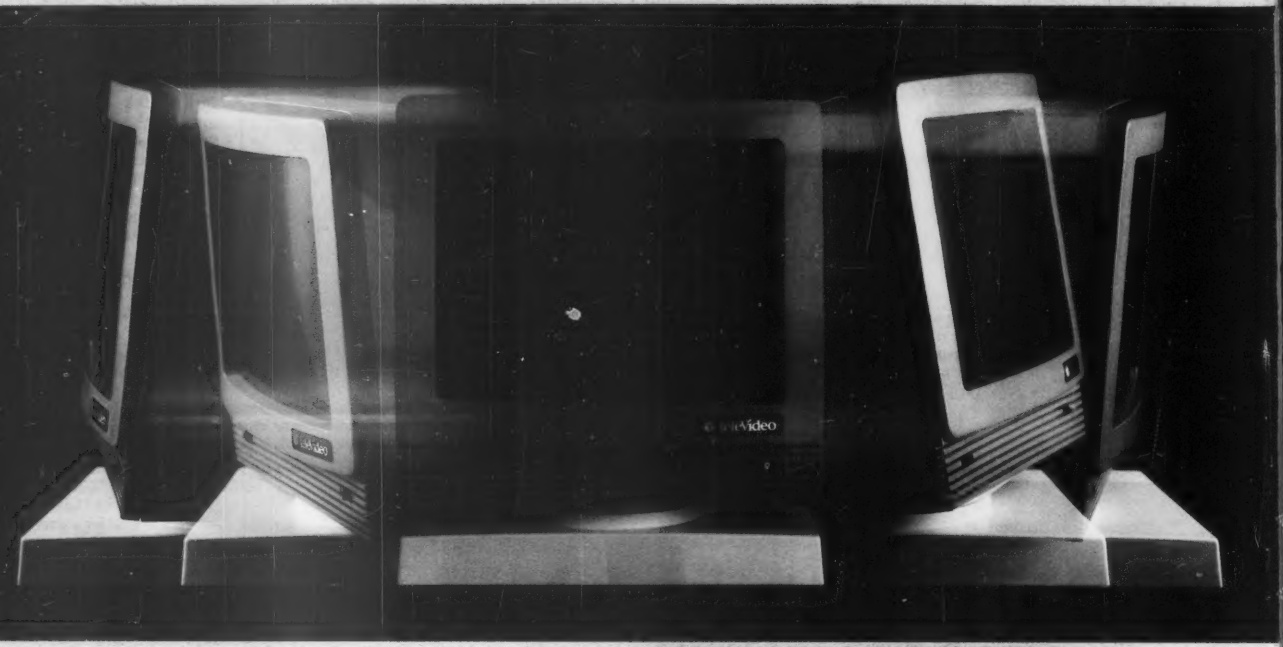
DB2 TEAM

from the

Computer Consulting Center, Inc.
575 8th Ave., NY, NY 10018
(212) 564-9088

Reasonable rates on DB2 Design, Programming & Training

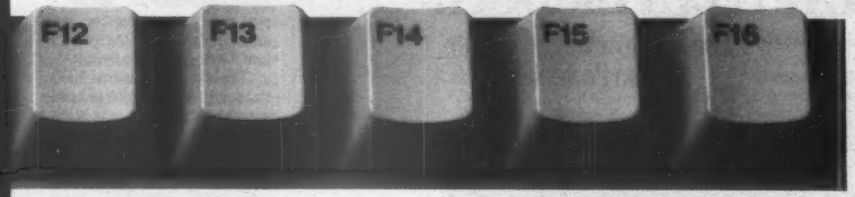
The TeleVideo 905 terminal. What a difference $10 makes.



Let's face it; there are a lot of $399 terminals being sold these days. You get a basic box, a few tacked-on bells and whistles, and not a whole lot more.

But now there's the TeleVideo® 905. At $409, it has a feature set so powerful, your customers will think they're sitting at an expensive workstation.

TELEVIDEO 905 VS. WYSE WY-30		
FEATURES	TELEVIDEO 905	WYSE WY-30
Programmable function keys	32	4
Tilt and swivel standard	Yes	No
High contrast super dark Matsushita screen	Yes	No
WordStar® mode	Yes	No
Full-size keyboard	Yes	No



For example, there's a sleekly designed monitor case with full tilt and swivel.

A full-size keyboard with sculptured keycaps for smooth, comfortable typing. Thirty-two non-volatile, programmable function keys. Keyswitches that have been tested to 100,000,000 strokes. Even an enhanced numeric keypad.

There's also a buffered printer port. And, of course, compatibility with the TeleVideo 925 command set, the most popular and widely emulated ASCII command set in the world.

If you'd like more information just get in touch with the nearest TeleVideo regional office listed below, and we'll give you the name of your nearest distributor.

The TeleVideo 905. What a difference $10 makes.

TeleVideo®
Settle for more.

TeleVideo Systems, Inc., 1170 Morse Avenue, Sunnyvale, CA 94088-3568, (408) 745-7760, Regional Offices: Northwest (408) 745-7760, Southwest (714) 476-0244, South Central (214) 550-1060, Southeast (404) 447-1231, Midwest (312) 397-5400, East (516) 496-4777, Northeast (617) 890-3282, AMSTERDAM: 31.2503.35444, PARIS: 33.1.4687.34.40, LONDON: 44.9905.6464.

© 1987 TeleVideo Systems, Inc. WYSE is a trademark of Wyse Technology. WordStar is a registered trademark of MicroPro International Corporation.

Dayflo

CONTINUED FROM PAGE 35

along, but we were not knocking down the door in terms of sales success," Gilchrist says.

In addition, the original Dayflo package was expensive, complex and required a hard disk drive and a lot of random-access memory. So despite all the hopes and the cerebral hype, the product flopped, and Gilchrist's health deteriorated.

By 1985, it looked grim for both Dayflo Software and Gilchrist, who was in and out of hospitals. He says that "1985 was our low year." Most observers forgot the company, and the venture capitalists and some of Dayflo's management staff began to count the company out.

But the fate of Dayflo Software was destined to mimic that of its founder, and Gilchrist is not willing to give up on his life or his company. While recovering from the heart transplant, Gilchrist began hatching a new scheme to make Dayflo Software a success. Rather than push the original Dayflo product, Gilchrist decided to develop a mass market version that would help establish a new category of software called information tracking. "While I was convalescing at home, motivation set in again," Gilchrist says.

Dayflo's Gilchrist

The new product, Dayflo Tracker, was introduced recently for $99 and is aimed at managers who need to keep track of projects, schedules, magazine article extracts, prospects and other items. "We were ideally situated with a text data base engine to pioneer information tracking," Gilchrist says.

Like the original Dayflo product, Tracker handles free-form text. As a result, records can be flexible, ranging from a two-word memo to a full business letter or article abstract. Data is stored and retrieved through a variety of ready-made forms, including correspondence, spreadsheets, document abstracts and word-processed documents.

In addition, Dayflo is offering the Application Pack, which is a series of business application templates for Tracker. The Application Pack is included with Tracker as part of an introductory offer and will sell separately for $39. Dayflo Tracker runs on IBM Personal Computers and compatibles and requires 1M byte of memory on a hard disk drive.

As for Gilchrist, things continue to look up. And as if reviving Dayflo Software and spending time with his wife and two children is not enough, Gilchrist recently enrolled in an MBA program. His employees joke about trying to lock him out of the office to keep him from overworking.

Rainbow

CONTINUED FROM PAGE 35

staggering margin. Through the end of 1986, some 183,000 Rainbows had been installed, compared with more than 7 million PC family units, according to International Data Corp., a Framingham, Mass.-based market research firm.

What went wrong? If the Rainbow was truly superior to the IBM PC, why did the public choose the lesser machine? "A lot of members feel that DEC could have done a better job marketing the machines," states Caroline Mack, managing editor of the International Rainbow Users Group's newsletter published in Vienna, Va. DEC had problems selling the machine in retail channels and, in early 1985, pulled it out of those channels as the Vaxmate plans took shape. Some observers have said the Rainbow is overpriced. At its introduction, a dual floppy-disk Rainbow 100 system listed for $3,245. Prices for the Rainbow line now start at $2,415.

In addition, Lotus Development Corp. brought out 1-2-3 for the IBM PC five months after the Rainbow's introduction. That program turned out to be as instrumental to the IBM PC's success as Visicalc was to the success of Apple Computer, Inc.'s Apple II system.

However, things might have been different if Barry James Folsom had had his way. As a manager in DEC's terminals division, Folsom was aware of IBM's impending PC and the momentum that PCs in general were gaining. In mid-1981, Folsom, now vice-president and general manager at Sun Microsystems, Inc.'s East Coast division, proposed what was to become the Rainbow. DEC initially gave him the go-ahead but then put the project on hold for six months, until Folsom's group built an upgrade kit that turned a VT-100 terminal into a CP/M system. That system, nicknamed the Robin, went nowhere. Folsom says that DEC's resolve to build a better engineered system than the IBM PC also contributed to the delay.

Folsom recalls that within DEC, the Rainbow was viewed merely as an "insurance policy" for the Professional workstation that was introduced with the Rainbow. The Professional, essentially a downsized PDP-11, was projected to be the big winner. "The context for the Pro was hundreds of thousands of units, and the initial plan for the Rainbow was tens of thousands," Folsom says. DEC had the right numbers but the wrong order. Folsom says that DEC may have lost as much as $500 million on its personal computer development efforts.

SIGN UP NOW!
Make your VTAM Network more secure, manageable, user friendly
With The Network Director your VTAM Network can:
☐ Interface to ACF2, RACF, or Top Secret
☐ Allow a single point signon for the network
☐ Dynamically tell users the status of applications
☐ Restrict application access by userid
☐ Provide custom menus by terminal or user
☐ Never say 'session not bound'
☐ Send broadcasts
☐ Create SMF records for network accounting
☐ Have Help panels and Bulletin Boards
☐ Send electronic mail between domains
☐ Provide real time Help Desk assistance
☐ Extend security to dial-up devices
☐ And more
The Network Director, from North Ridge Software, requires no modifications to VTAM or the operating system, works with all levels of VTAM, and runs under MVS, VSE, or VM/GCS.
The Network Director can automate signon to CICS, IMS/DC, IDMS/DC, TSO, CMS, Model204, Roscoe, NCCF, Netview, Com-plete, and more.
Full network security can be accomplished through supplied interfaces to ACF2, RACF, Top Secret, the VM Directory, or The Network Director itself.
The Network Director fully supports cross domain, CMC, ENA, and SNI environments, and can be installed in less than a day.
Sign up now for more information. Call today or mail the coupon to North Ridge Software, Inc., 14450 NE 29th Place, Suite 111, Bellevue, WA 98007-7699. Telephone: (206) 882-2600. Telex: 5106014846 (NRIDGE SOFTWARE).
THE NETWORK DIRECTOR
(Please fill in or attach business card)
☐ I'm interested in a trial of THE NETWORK DIRECTOR
☐ Please have one of your specialists give me a call
☐ Please send me more information
Name
Title
Address
Organization
City/State/Zip
CPU(s)
Operating System(s)
North Ridge Software, 14450 NE 29th Place • Suite 111 • Bellevue, WA 98007-7699 • 206/882-2600
Local representatives in: Austria, Belgium, Denmark, France, Ireland, Luxembourg, Monaco, Netherlands, Northern Ireland, Norway, Sweden, Switzerland, South Africa, United Kingdom, West Germany. The following are proprietary software products of: ADR—Roscoe; CA—Top Secret; CCA—Model204; Cullinet—IDMS/DC; IBM—CICS, CMS, IMS/DC, NCCF, Netview, RACF; Software AG—Com-plete; UCCEL—ACF2.
CW 5/18/87

NEW PRODUCTS

Systems

Kay Elemetrics Corp. has introduced the **Micro Speech Lab**, a desktop computer system said to enable the capture, playback and analysis of speech and other signals.

The software includes user control of signal input, wave-form displays, audio output, analysis displays such as spectrum, amplitude and pitch and file management.

The software runs on IBM Personal Computers and compatibles with 192K bytes of memory, an IBM Color Graphics card and a color monitor.

The Micro Speech Lab, including diskette, microphone, headphone and manual, is priced at $1,450.

Kay Elemetrics, 12 Maple Ave., Pine Brook, N.J. 07058.

Software applications packages

Xpercom Corp. has introduced **Thoughtline**, a personal computer software package said to use artificial intelligence to build a document outline.

Thoughtline is based on a pattern-matching and word-substitution program. It asks the user questions and then restructures the responses to produce a document outline.

Thoughtline runs on IBM Personal Computer ATs, XTs and compatibles. It costs $295.

Xpercom, 3605 Luallen, Carrollton, Texas 75007.

Software languages

Expertelligence, Inc. has released **Experprolog II**, the Prolog II aritificial intelligence programming language for IBM Personal Computers and compatibles.

Experprolog II is said to feature the ability to implement infinite trees or cyclic data structures and the ability to freeze a predicate until all desired parameters are instantiated.

According to the vendor, the Experprolog II source code is compatible for both Microsoft Corp. MS-DOS-based IBM PCs and Apple Computer, Inc. Macintosh systems, except for certain machine-specific sections.

Experprolog for the IBM PC is priced at $395.

Expertelligence, 559 San Ysidro Road, Santa Barbara, Calif. 93108.

Software utilities

Hewlett-Packard Co. has announced the **Lotus Driver 1002**, a three-disk package of Lotus Development Corp.-compatible peripherals software drivers.

The Lotus Driver 1002 is said to enable all versions of Lotus's 1-2-3 and Symphony to run on HP's personal printers and plotters. Printers and plotters supported include the Laserjet printers, Thinkjet, Quietjet Plus, the 2930 series printers, the Colorpro and the 7470, 7475 and 7550 plotters, operating both in paper and transparency modes.

The three-disk package is available for $25 per disk.

HP, 1820 Embarcadero Road, Palo Alto, Calif. 94303.

Development tools

Logic-Ciel has introducd **Proq-CICS**, a personal computer-based on-line program development tool.

According to the vendor, Proq-CICS is said to allow users to paint the screen, supply the characteristics of the fields and command the program to generate the code. All of the IBM CICS program code required by the mainframe is automatically generated. Generated Cobol programs are said to be ready for compilation on the mainfame.

Proq-CICS is priced at $898.

Logic-Ciel, 1321 Sycamore Ave., Bethlehem, Pa. 18017.

Software enhancements

Softcraft, Inc. has announced **Version 3.0** of its **Fancy Font** printing enhancement software.

Version 3.0 is said to have the ability to include graphics in a document, select colors on printers such as Epson America, Inc.'s EX80 and JX80, edit and print fonts containing up to 256 characters, print in landscape orientation with any fonts on Hewlett-Packard Co. Laserjet and Laserjet Plus printers and mix Softcraft and native fonts anywhere in a document.

Fancy Font Version 3.0 costs $180.

Softcraft, Suite 500, 16 N. Carroll St., Madison, Wis. 53703.

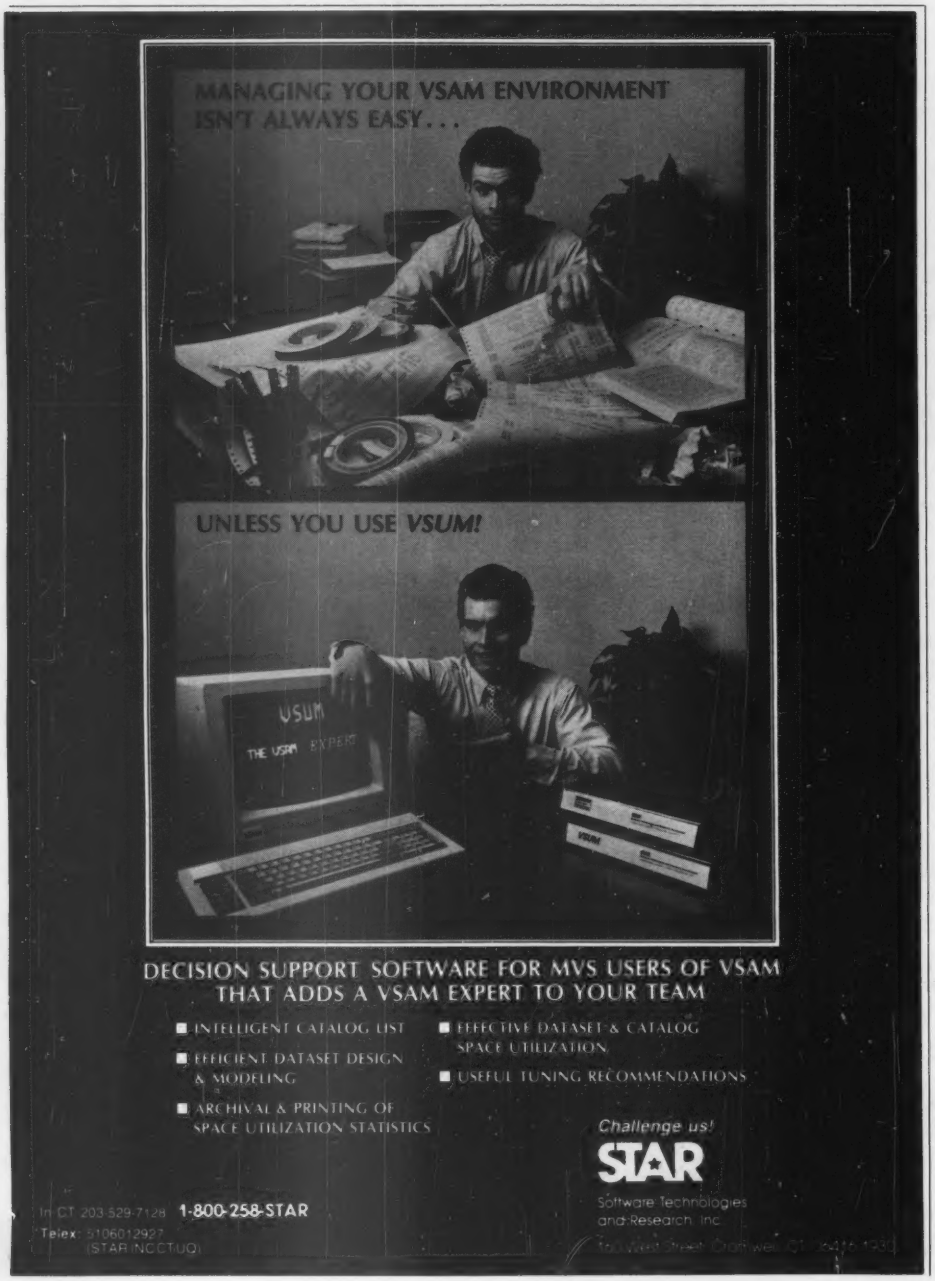
Printers/Plotters/ Peripherals

C. Itoh Digital Products, Inc. has announced the **Prowriter Jr. Plus**, an enhanced version of its Prowriter Jr. dot matrix printer.

The Prowriter Jr. Plus is said to offer print speeds of up to 160 char./sec. in draft mode. Throughput speed is said to be 61 line/min. Features include Epson America, Inc. FX-80+ emulation as well as built-in IBM character sets.

The Prowriter Jr. Plus costs $369.

C. Itoh, Suite 220, 19750 S. Vermont Ave., Torrance, Calif. 90502.

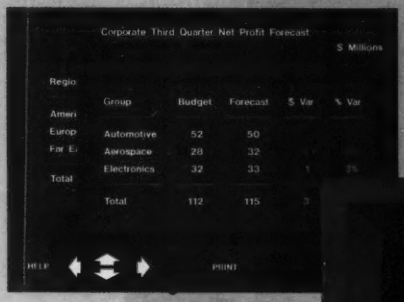

MANAGING YOUR VSAM ENVIRONMENT ISN'T ALWAYS EASY...
UNLESS YOU USE VSUM!
VSUM
THE VSAM EXPERT
DECISION SUPPORT SOFTWARE FOR MVS USERS OF VSAM THAT ADDS A VSAM EXPERT TO YOUR TEAM
■ INTELLIGENT CATALOG LIST
■ EFFICIENT DATASET DESIGN & MODELING
■ ARCHIVAL & PRINTING OF SPACE UTILIZATION STATISTICS
■ EFFECTIVE DATASET & CATALOG SPACE UTILIZATION
■ USEFUL TUNING RECOMMENDATIONS
Challenge us!
STAR
Software Technologies and Research, Inc.
In CT 203-529-7128 1-800-258-STAR
Telex: 5106012927 (STAR INCCTUQ)

COMMANDER™

Executive Information System

SEMINAR

Why are executives using EIS?

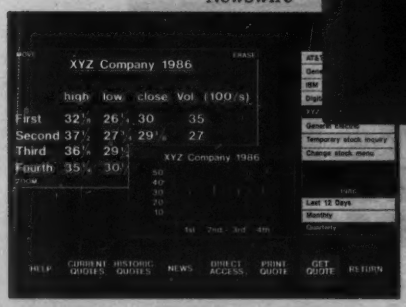


Briefing Book

How much support does EIS require?

Investigate/Execu-View™

Newswire™



Builder's Tools

How does EIS integrate diverse information sources?

How easy is EIS to implement?

Dates and Locations

Atlanta, GA	May 19	New Orleans, LA	June 17
Austin, TX	June 10	New York, NY	June 2
Birmingham, AL	May 21	Orlando, FL	June 4
Boston, MA	May 27	Parsippany, NJ	May 27
Charlotte, NC	June 9	Philadelphia, PA	June 2
Chicago, IL	May 21	Phoenix, AZ	June 23
Chicago, IL	June 23	Pittsburgh, PA	June 18
Cleveland, OH	June 16	Research Triangle Park, NC	June 10
Dallas, TX	May 20	St. Louis, MO	June 10
Denver, CO	June 3	Salt Lake City, UT	June 24
Detroit, MI	May 27	San Antonio, TX	June 11
Grand Rapids, MI	June 2	San Diego, CA	July 14
Hartford, CT	June 4	San Francisco, CA	May 19
Houston, TX	May 27	Santa Clara, CA	June 2
Indianapolis, IN	May 27	Seattle, WA	May 21
Irvine, CA	June 4	Tampa, FL	June 3
Los Angeles, CA	May 27	Toledo, OH	May 19
Memphis, TN	May 27	Tulsa, OK	June 24
Miami, FL	June 2	Washington, DC	June 4
Minneapolis, MN	May 27	White Plains, NY	May 19
Nashville, TN	May 28		

Commander EIS runs on IBM mainframes using VM/CMS or MVS/TSO operating systems, and on DEC VAX/VMS. The personal computer version runs on IBM PC/AT, COMPAQ DESKPRO 386 or fully compatible microcomputers with ECA and either a mouse or a touch screen.

Looking for EIS Answers?

Then come to a free Commander Executive Information System Seminar. Not only will you get practical answers, you'll see Commander Executive Information System (EIS) software in action. Demonstrations will include the Briefing Book, Investigate, Newswire, and Builder's Tools applications.

Major corporations have looked to Comshare for flexible, timely information systems for 21 years. And now they look to us for EIS software, too. More than 40 of them have selected the Commander EIS approach. With the experience we've gained from these implementations, Comshare is uniquely qualified to help you make an informed decision about EIS.

Register for the Commander Executive Information System Seminar by calling Chris Kelly at Comshare. 1-800-922-7979. Or in Michigan, 313-994-4800.

COMSHARE®

1-800-922-7979

3001 South State Street
Ann Arbor, Michigan 48108

Copyright © 1987 by COMSHARE, INCORPORATED

The improvements

The original 8-MHz COMPAQ DESKPRO 286.® Best in its class.

Introducing the new 12-MHz COMPAQ DESKPRO 286.® 50% faster, 100% Compaq.

You've never seen this much performance in an 80286-based desktop. Numerous enhancements to its proven technology are one more example of how Compaq maintains its industry leadership by improving and innovating.

Compaq raised the standard from 6- to 8-MHz processing speeds. Now we're setting the pace again with 12 MHz, so you can run industry-standard software up to 50% faster.

And so you won't lose compatibility, we pioneered dual-speed processing, which reduces speed from 12 to 8 MHz in the few cases it's needed.

Compaq also maintains hardware compatibility with 8-MHz expansion slots that let you use industry-standard expansion boards, modems and add-ons without sacrificing your 12-MHz speed.

Hidden assets

While many manufacturers cripple high-speed processors with low-speed RAM, Compaq gives you up to 2.1 Megabytes of 12-MHz RAM on the system board without using an expansion slot, 8.1 Megabytes using only three.

Speed is also boosted by high-performance 20-, 40- or 70-Megabyte fixed disk drives with some of

are out of sight

The new 12-MHz COMPAQ DESKPRO 286. Now the best is better.

the industry's fastest access times. And to protect data, we offer an internal 40-Megabyte fixed disk drive backup system, another innovation.

Uncompromising vision

The COMPAQ DESKPRO 286 gives you better display options than any other PC in its class.

The COMPAQ Dual-Mode Monitor displays both high-resolution text *and* graphics. And the COMPAQ Color Monitor and COMPAQ Enhanced Color Graphics Board support EGA and CGA standards, displaying 16 colors at once from a palette of 64.

You get more expandability too—with seven available full-height expansion slots and room for four *internal* half-height storage devices, including 1.2-Megabyte or 360-Kbyte diskette drives.

See for yourself

Our improvements may be hidden, but they're clearly apparent in superior performance. That's why the most demanding users prefer Compaq. And why we can offer a full-year limited warranty.

Seeing is believing. For the location of your nearest Authorized COMPAQ Computer Dealer, or for a free brochure, call 1-800-231-0900, operator 20. In Canada, 416-449-8741, operator 20.

©1987 Compaq Computer Corporation, all rights reserved.

COMPAQ®

It simply works better

We designed our V.32 modem on the premise that speed is useless without reliability.

At Codex, we understand that all the speed in the world won't get you anywhere if you can't depend on it. And that's why we developed our V.32 modem to give you 9600 bps full-duplex dial transmission, rivalling the reliability of a dedicated leased line.

Admittedly a pretty big claim.

But then, it's really what you'd expect from the recognized leader in high speed modems. In fact, more data communications professionals prefer Codex than any other brand.* And it's our high speed modem expertise that has allowed us to make a modem that not only meets, but exceeds the V.32 standard.

Our V.32 modem uses the same VLSI technology and forward error correction scheme (Trellis Coded Modulation) as our high speed leased line modems that reliably transmit data up to 19,200 bps.

So, you can be sure of continuous high quality transmission over a wide range of line conditions. This now allows you to cut connect time and save money by sending data at up to 9600 bps full duplex over ordinary dial lines.

We've even added a proprietary long haul echo cancellation feature, eliminating both local and distant echoes that can plague dial networks. So even if the phone company sends your data over satellite links, it arrives intact.

Plus our V.32 modem includes a soft strap front panel, multiple ACUs, a nest card option for maximum space savings, and operates in synchronous or asynchronous applications.

To find out more about the Codex V.32 modem, call **1-800-426-1212, Ext. 235.** Or write Codex Corporation, Dept. 707-35, 7 Blue Hill River Road, Canton, MA 02021-1097. You'll discover that when we tell you about a V.32 with high speed performance and reliability, we're not blowing smoke.

codex
MOTOROLA

*McGraw-Hill's *Data Communications* Brand Preference study cites Codex as offering the best technology, best price performance ratio, best service organization, and most informative literature for various modem, multiplexer and network control product categories. © 1986 Codex Corporation. Motorola and Ⓜ are trademarks of Motorola, Inc. Codex is a registered trademark of Codex Corporation.

Visit Codex booth #1621 at the ICA show, May 18-21, and at NOAC booth #535-41, May 31-June 2

DATA STREAM

Clare Fleig

A look inside SAA concept

This is the first of a two-part series.

IBM's March introduction of Systems Application Architecture (SAA), a set of guidelines, interfaces and procedures for systems working within Systems Network Architecture, has left much confusion in its wake.

Essentially, SAA has been given the responsibility for gathering all of IBM's incompatible operating systems, communication links, applications and processors into one container.

Think of it as IBM's garage-building exercise. At present, IBM has numerous vehicles of all shapes, sizes, fuel requirements and capabilities parked around the corporation in offices and on factory floors. SAA, once it is fully implemented, will provide a structure housing all of these vehicles under one communications roof, with defined doors for entering and leaving both the vehicles and the garage itself. As such, the physical location of the data and the vehicle it is using will be irrelevant.

Continued on page 48

IBM exec outlines net strategy

BY PATRICIA KEEFE
CW STAFF

AMELIA ISLAND, Fla. — MIS can rest assured that network management is a key component of its maturing communications strategy, according to an IBM executive who spoke at a recent seminar held here.

IBM plans to provide links to non-IBM systems via CCITT X.25 and Open Systems Interconnect standards and to connect to voice systems through Integrated Services Digital Network, said Lark Allen, manager of IBM's Telecom Marketing Program in Research Triangle Park, N.C., while speaking at this year's International Data Corp.'s (IDC) Spring Executive Conference.

"IBM's objective is to give users end-to-end control of their network," Allen said. IBM will do this by providing users with both centralized and distributed network management tools and by providing full Systems Network Architecture (SNA) functionality across IBM's range of systems.

The challenge here, he said, "is to be able to build SNA networks without [IBM] 370-type systems in them." IBM will meet that challenge via a peer-to-peer architecture, Allen added.

In addition, IBM has recognized such user requirements as nondisruptive technology growth and integrated systems solutions.

A poll of users attending the IDC seminar revealed that networking management and support for multivendor networks is a top priority.

Widespread use of multivendor solutions among the respondents led to little support for either IBM's Netview network

Continued on page 50

Data View

Where T1 lines are going

The bulk of T1 traffic remains within the local access and transport area

T1 lines — U.S. installed base, 1985 to 1989 (in thousands)

	1985	'86	'87	'88	'89	Percent of Compound Annual Growth Rate
Long-haul T1 lines leased from interexchange carriers	1.4	2	3	4	6	43
Local T1 lines leased from regional Bell holding companies	6	9	13	18	26	44
Private bypass networks (largely for local loop)	4	5	7	9	12	32
All T1 lines	11.4	16	23	31	44	40
All T1 terminations	22.2	32	45	62	88	40

INFORMATION PROVIDED BY SALOMON BROTHERS, INC.
CW CHART

Mac boost from 3Com

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — Users of networked Apple Computer, Inc. Macintoshes can expect to see the first phase of 3Com Corp.'s 3+ network software for the Mac this summer, according to Derek Brown, 3Com's product manager for Macintosh products.

The software will reportedly allow file transfer between IBM computers and compatibles on an Ethernet or token-ring network and Apple's Macintosh family — either Mac IIs and SEs with an Ethernet adapter or the older Mac and Mac Plus running over the Appletalk network.

Continued on page 50

PC use up, standards needed

BY DONNA RAIMONDI
CW STAFF

BOSTON — The enormous pressure to achieve computer connectivity is both fueled by the sale of billions of corporate microcomputers and dampened by the lack of standards implementation, said speaker Larry DeBoever at a recent Digital Consulting, Inc. seminar.

Since IBM's introduction of its Personal Computer, more than 16 million micros have been installed in business, science and education facilities, according to DeBoever, a vice-president and consultant at Andover, Mass.-based Digital Consulting.

There is a clear trend in PC applications toward I/O-intensive data base use, which has created a need for better data transfer, data management and a variety of connectivity options, DeBoever said.

Continued on page 46

Inside

- Data Language rolls out 4GL, relational DBMS for PC nets. Page 46.
- AST Research announces multitasking controller for PCs in DEC environment. Page 52.
- Gandalf Data unveils intelligent interface for PACX systems. Page 52.

printf("Hello, MAINFRAME world\n");

Meet the Industry's New Standard for Mainframe C Compilers

SAS Institute Inc. announces a mainframe version of the Lattice® C compiler—your key to truly portable applications.

With our compiler, you can develop C programs on IBM 370 machines, interface easily with non-C programs and software packages, and protect your programming investment across operating environments. Virtually every new computer supports C, and portable programs created with the mainframe compiler under OS or CMS will run on any other machine with a C compiler.

The mainframe compiler uses standard IBM linkage conventions. Assembler programs, MAIN routines in other high-level languages, and packages such as IBM's ISPF and GDDM can be invoked directly from C.

And you can use C, instead of assembler, to develop small and fast subroutines called from other languages.

We designed the compiler listing and cross-reference to make programs easy to follow and errors easy to find. An extensive library offers functions from Kernighan and Ritchie and the Lattice PC C compiler. The run-time library produces explicit numbered error messages and a traceback of active function calls if an error occurs.

For all the facts—including details on economical annual licensing complete with free technical support and enhancements—call your Software Sales Representative today.

SAS is a registered trademark of SAS Institute Inc.
Lattice is a registered trademark of Lattice, Inc.

Copyright © 1986 by SAS Institute Inc. Printed in the USA.

SAS Institute Inc.
Box 8000 □ SAS Circle
Cary, NC 27511-8000
Phone (919) 467-8000
Fax (919) 469-3737

PC standards

CONTINUED FROM PAGE 45

The mainframe will not go away. "Corporate data bases will remain on the centralized mainframe because of the volume of data and the investment in applications. To convert that 1965 payroll package for the PC would take man-years, and nobody is going to do that," he said.

Departmental minicomputers will continue to relieve the mainframe's duties while the mainframe grinds away at the application development backlog. PCs will leave their role as dumb terminals and increasingly transfer files, he said.

Two years ago, 75% of corporate PCs acted as dumb terminals while 25% did file transfer, a situation that has been exactly reversed. PCs equipped for interconnection to the mainframe, minis or each other grew from 40% of all PCs in Fortune 1,000 companies in 1984 to 60% in 1986, DeBoever said.

Different machine models, operating systems, languages and file-management systems can be connected physically using gateways, protocol converters and PC coaxial adapters, but the requirement for logical interconnection remains unmet.

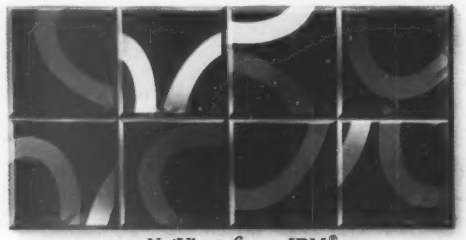
"Users don't want to learn four operating systems. They have application skills, not computer skills," DeBoever said. The connectable systems of the future, say in the next three to five years, will need "culturally consistent" interfaces across disparate systems, he said. A user of Microsoft Corp.'s MS-DOS, for example, would employ familiar commands all the time, no matter which network node he was accessing by his PC.

"The major obstacle to logical interconnectivity is the lack of standards implementation," DeBoever said. While a long list of important standards is emerging, DeBoever said IBM's Systems Network Architecture (SNA) and the Open Systems Interconnect (OSI) model will emerge as the two dominant, complementary standards. With SNA providing protocols for mainframe-to-terminal connection and OSI linking minis to minis, IBM's Advanced Program-to-Program Communications will emerge as the standard programming interface to both, he said.

Integrated Services Digital Network (ISDN) will hit like a tidal wave in two years, DeBoever said. In addition to providing wide-area high-performance connectivity at less than current lease-line charges, ISDN will also significantly improve file-transfer performance between PCs and IBM hosts over leased-line networks, he added.

DeBoever predicted that large metropolitan areas will have ISDN services in two years, while the rest of the country will follow in five or more years.

New network service applications, probably built into the operating system, will include applications such as data transformation and distributed data dictionary applications, distributed data base management and document interchange facilities.



NetView from IBM.®

NET/MASTER™ from CINCOM.®

"NET/MASTER™ Is The Most Complete Network Management Solution Available" – Datapro®

The way to solve the network management puzzle is with software components that are made to fit together.

That's why you need to compare NET/MASTER with NetView.

Our 30-day trial will show you why Datapro called NET/MASTER the only total network control system available for the IBM mainframe environment. And added, "NET/MASTER is a giant step in the direction of peak operating efficiency."*

Integration Is The Answer.

NET/MASTER lets you manage your VTAM network with greater control, efficiency and reliability than IBM's NetView. Because NET/MASTER is a comprehensive, fully integrated system that lets you tie together TSO, CICS, MVS, VTAM, GCS, VSE, JES 2 AND JES 3. Plus it gives you powerful capabilities in the areas of multiple session management, network security, easy access through network menus and file transfer.

The bottom line is increased network availability and enhanced service levels for all users.

We'll Give You A Trial Run.

See for yourself why more than 300 companies have implemented NET/MASTER— the real network management solution.

To arrange for your 30-day trial, or to get more information on NET/MASTER, call us today. Or write Marketing Services Department, Cincom World Headquarters, 2300 Montana Avenue, Cincinnati, Ohio 45211.

1-800-543-3010

In Ohio, 513-661-6000.
In Canada, 1-800-387-5914.

CINCOM

Advanced Systems And Applications Software For IBM And VAX

*Datapro 70 report, Datapro Research Corporation, September, 1986. IBM is a registered trademark of International Business Machines Corporation. Rubik's Magic™ is a trademark of Seven Towns Ltd. used with permission. The illustration of Rubik's Magic™ is by permission of Rubik Studio ©1986. All rights reserved. Distributed by MATCHBOX TOYS (USA) Ltd.

DBMS, 4GL run on Netbios LANs

BY DONNA RAIMONDI
CW STAFF

BILLERICA, Mass. — A fourth-generation language and relational data base management system for IBM Netbios-compatible Personal Computer networks was introduced recently by Data Language Corp.

The $2,450 LAN Progress, a data base server version of Data Language's Progress, runs on local-area networks (LAN) such as Novell, Inc.'s Advanced Netware, IBM's Token-Ring and PC networks and Excelan, Inc.'s Exos.

The product consists of two main components: a data base server engine and a fourth-generation language. The server controls access to the data base. It contains facilities for data dictionary control, referential integrity and automatic multiuser record locking.

The fourth-generation user interface features automatic forms generation, windowing, split screens, color and keystroke-level application control. It also contains procedural constructs for data selection, manipulation and display for development of multiuser applications.

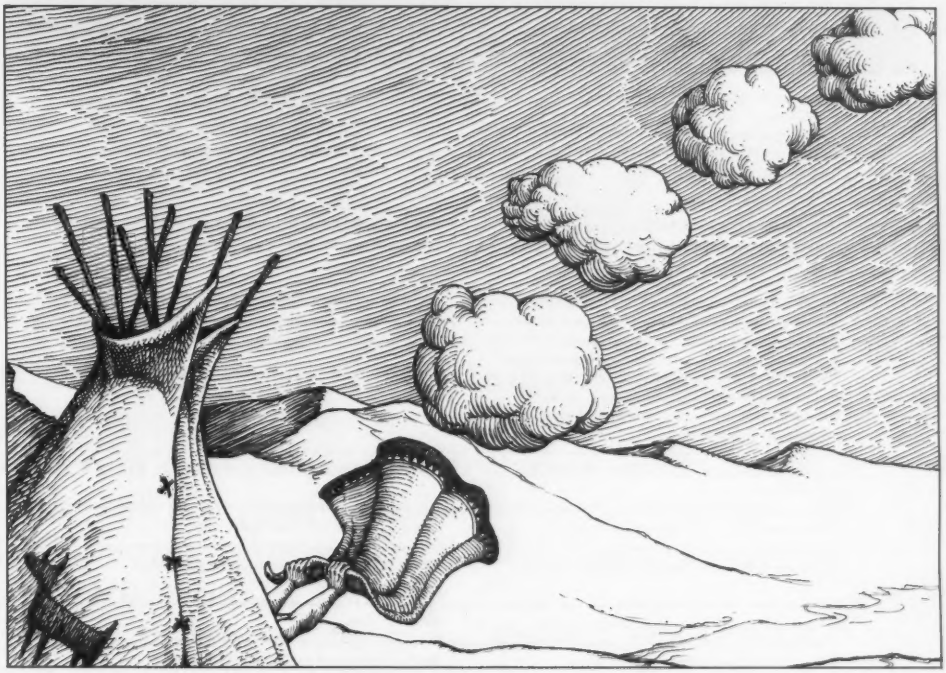
An application developed under LAN Progress is portable to any other system — whether single- or multiuser or networked — running Progress, the vendor said.

For beta-test user Fred Herzog, president of software development house Fred Herzog & Associates in New York, LAN Progress's automatic crash detection and recovery capability is a "great feature." A power outage caused by an electrician who cut a circuit at Herzog's office proved to him that a before-image file feature saves data in mid-update, he said. "You can just shut the machine down, and it automatically backs it out," he added.

Herzog uses an IBM Token-Ring LAN to connect 10 nodes running tasks in the financial services area, he said. He had decided to use Data Language's Progress fourth-generation language and DBMS on a Unix minicomputer when the company changed direction and decided that a LAN was more cost-effective than a minicomputer system, he explained.

"Once you have the programs loaded in the morning, all the programs are resident on the PCs. Most of the processing is done on distributed machines here," Herzog said.

There are still a few communications systems we can't connect to Wang.



Luckily, precious few. Thanks to ITT Worldbridge.℠

ITT Worldbridge is an integrated electronic messaging service that can connect your Wang VS users to incompatible systems worldwide.

Whether these systems are IBM DISOSS, DEC VAX/VMS or other Wangs. Whether they are corporate information systems, office automation systems, private message networks, public and private electronic mail systems, or the public telex network.

Best of all, ITT Worldbridge OfficeAccess℠ service can do this using the Wang VS system you already have in place. It requires no additional programming. No special equipment.

Worldbridge

And because many messages are switched directly from one system to another, without passing through the telex network, they can be sent and delivered at much higher speeds and without any rekeying.

Equally important, at significantly lower cost.

In short, Worldbridge can increase your company's communications capabilities almost beyond measure.

But that should come as no surprise. Because from 50 baud telex, to 2.048 megabit satellite transmission, to digital packet switching, ITT Worldcom offers a spectrum of communications services to meet the needs of any company.

To find out more about Worldbridge, or arrange to get a free demonstration diskette, call us at 1-800-922-0184.

Or write: Director, ITT Worldbridge Marketing, 100 Plaza Drive, Secaucus, NJ 07096.

We may not be able to connect you to every communications system in the world.

Just every one that's worth the connection.

Trademarks: Wang and Wang VS—Wang Laboratories, Inc.
IBM DISOSS—International Business Machines Corporation.
DEC VAX/VMS—Digital Equipment Corporation.

COMMUNICATIONS SERVICES VIA ITT

© 1987 ITT World Communications Inc.

A look inside SAA

CONTINUED FROM PAGE 45

SAA's primary goal is to make IBM's long list of incompatible processors, operating systems and applications compatible in use, if not in system design. IBM also gains added leverage by providing the functionality of an open system while keeping the actual processors proprietary. Entrance to the SAA environment will be possible — and in some cases encouraged — for a range of third-party developers, but the entry methods will be carefully controlled by IBM.

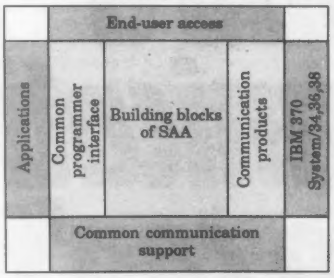
Despite all this, SAA is not the cure-all IBM is suggesting it might be. Currently, IBM specifies only three processor families, defined as "major computing environments," for support under the SAA umbrella: the 370, the System/34, 36 and 38 and the Personal Computer.

It is unclear whether other IBM architectures, including the 8100 Information System, the Series/1 minicomputer and the RT PC, will benefit from SAA streamlining. IBM officials have acknowledged privately that some systems and environments, such as IMS, may never be supported under SAA.

Although IBM's ambition for a single-user interface and applications transparency is noble, getting there will be more than half the battle. Migration will not be easy. Users will be faced with rewriting many applications.

In the OS/2 environment, for example, all time-dependent applications — such as communications and network-dependent, hardware-specific and interrupt-driven applications — must be rewritten to run under OS/2. At a minimum, programs written in a high-level language must be recompiled and relinked. Most programs will require some source code alterations for the new environment. MIS managers will be forced to spend a significant amount of applications development time and effort just keeping abreast of IBM's transitions.

Components for IBM SAA



INFORMATION PROVIDED BY INTERNATIONAL TECHNOLOGY GROUP
CW CHART

SAA components

IBM defines SAA as a "collection of selected software interfaces, conventions and protocols that create a framework for development of consistent applications across IBM's computing environments." It consists of five key components: common programmers interface, common user access, common communications support, common applications and support for the implementation of many foreign languages (see chart).

From the end user's perspective, SAA specifies a set of screen layouts, menu presentation and selection techniques, such as windowing and graphics capabilities, keyboard layout and use and display options, that are incorporated under the guidelines of the common user access portion of the architecture.

Its purpose is to give users the option of sitting down at any PC, Personal System/2 or terminal and using the same approach to access any data in the system.

IBM has promised that SAA will eliminate the need to learn several sets of commands — one for Microsoft Corp.'s MS-DOS or IBM's PC-DOS, one for the 3270 environment and yet another for the System/34, 36 and 38 family. But this will be time-consuming in both new product development and program migration.

From a programmer's perspective, the common programming interface set contains a set of languages, such as Cobol, Fortran and C, and interfaces, such as data base, query (SQL), presentation and dialog, that enables development of programs that will operate within the SAA framework.

Programmers who explicitly follow IBM's interface specifications can be sure their software will run with other SAA products.

Programmer shutout

Those programmers who try to write around the SAA specifications will find themselves shut out of the IBM environment.

This stringent approach is likely to be hardest on the PC community, which has enjoyed a much freer development environment under MS-DOS than will be possible under the many layers incorporated into SAA guidelines.

Additionally, fewer packaged development tools will be available. IBM will publish interface specifications and some programmer's tool kits, but going down to a local computer dealer and buying an SAA connection kit won't be an option.

Fleig is director of systems research specializing in local-area networking and IBM communications for International Technology Group in Los Altos, Calif.

Two ways to expand your VM System.

Ours. Theirs.

Single System Image (SSI) from VM/CMS	VM Inter-System Facilities (ISF) from IBM
You can use any processors in Group 10, 20, 30, or 40 in an SSI complex.	IBM's ISF does not support Group 10 and 20 processors. In Group 30, ISF only supports 4381's with 16 megabytes or more, and 3083's. In Group 40, ISF does not support the 3081 D16 processor.
You can use IUCV and VMCF to communicate between programs across processor boundaries in an SSI complex.	With IBM's ISF, you can't use IUCV and VMCF across processor boundaries.
An SSI complex supports up to 33 processors.	IBM's ISF is limited to two CPUs.
SSI dynamically switches virtual machines from one processor to another to satisfy user requirements. This means a user's terminal and virtual machine can be on different CPUs. As a result, duplicate software licensing and maintenance charges can be reduced or eliminated.	IBM's ISF offers no switching capability.
You can use any version of VM/SP or VM/HPO in an SSI complex.	IBM's ISF requires that you use HPO 4.2.
SSI balances the user load automatically.	IBM's ISF doesn't do load balancing.
SSI supports FBA and Count/Key/Data devices.	IBM's ISF inter-system link and spool facilities do not support FBA devices.
SSI doesn't require extended storage support.	IBM's ISF does.
SSI has been in production since 1980. It's available *today!*	IBM's ISF *planned availability* isn't until August 1987.

SSI allows multiple VM-based CPUs to communicate with each other in order to present a single system image to the users. SSI is the only current alternative to CPU upgrades that can keep user communities whole when the exhaustion of resources fragments those users onto multiple CPUs.

An SSI complex offers the reliability and availability of multiple-processor configurations together with the convenience of a single processor.

To explore our way, call or write Charles Aronovici at VM/CMS Unlimited. He'll be happy to tell you about SSI and our other system-expanding products.

Single System Image (SSI)
from
VM/CMS Unlimited, Inc.
161 Granite Avenue, Boston, MA 02124
617 288 4434 800 443 4317

VM/CMS
Expanding the vision of VM.

Good news for those who value privacy.

Congress has just added something to the data stored in every computer in America: more protection.

Thanks to recent legislation, the laws that cover data security now cover more. There are stiff new penalties and new protections. Prying into electronic mail is now as criminal as opening the U.S. Mail and even the government cannot intrude without a warrant.

Private citizens, trade associations, civil liberties groups and the law enforcement community all worked together to make these measures law. Computer firms, with a special concern for data security, were also strong supporters.

The right to keep the information that you value private is a precious right. Measures that protect it are good news indeed.

IBM®

©Copyright IBM Corporation 1987

Mac boost

CONTINUED FROM PAGE 45

3Com's 3Server3 file server, which contains an internal Appletalk port, will be required, but workstations using 3+ for the Mac will be able to access Apple's Appleshare file server, 3Com said.

3Com plans to release 3+ for the Mac in two stages, according to Doug Pollack, 3Com's manager of corporate marketing. Set to be included in the first stage are the print and file services under 3+Share, 3+Netconnect and adapter support. The second phase, slated to arrive in the fall, will include 3+Mail and allow users to install software on the 3Server for the Mac, he said.

"3+ for the Mac will have all the capacity of 3+ today, using the same file, print, mail and naming service," Brown added, "just on a different machine."

Despite some reports to the contrary, 3Com said it has no plans to allow users of 3+ for the Mac to utilize less expensive standard IBM Personal Computer ATs or compatibles as file servers.

Regardless of the Macintosh model, server performance will reportedly be the same. However, on the client side, Brown said, users can expect a higher performance level on the newer Macintoshes.

3Com's current offering for Apple users is Etherseries, a disk-server technology that will be phased out, Brown said.

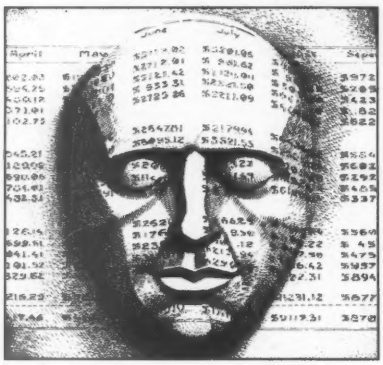
The Etherseries technology involves writing twice to the disk — under both the Microsoft Corp. MS-DOS and Apple DOS formats — and then doing a translation. "None of this is necessary under 3+ for the Mac, saving a lot of disk space," Brown said. Users who purchased Etherseries Enhanced will reportedly receive a free upgrade to 3+ for the Mac. "It clearly shows that Etherseries is not a strategic product," said Wes Raffel, director of marketing for 3Com's Hardware Products Division.

3+ for the Mac will not compete with Appletalk, 3Com said. "Appletalk networks are OK if you're just doing peripheral sharing. But if you have five to 15 users or you want to intermix [MS-]DOS and the Apple world, you do need the increased bandwidth of Ethernet," Raffel said. 3Com is also shaping marketing plans for its file server based on the Intel Corp. 80386 processor, Raffel said.

The 3Server3, currently 3Com's high-end server, will be repositioned and repriced as an entry-level system for intranetworking, featuring four to six nodes that need basic networking services, Raffel said. "These users are not interested in token-ring-to-Ethernet, just basic file service," he added.

The as-yet-unnamed 386-based file server will function as the advanced server for users who are interested in networking between the work group and a minicomputer or mainframe, Raffel added. However, both he and 3Com Chairman Robert Metcalfe said 3Com has no plans to develop a gateway to IBM's Systems Network Architecture.

Think of it as a spreadsheet that thinks.



Introducing IFPS/Plus with artificial intelligence.

Ask IFPS/Plus a question in plain English: "Why, when revenues went up, did net income go down?"

The system uses its artificial intelligence to analyze influencing factors, then gives you the answer in equally plain English.

You know what happened and *why* it happened.

What's best?

IFPS/Plus solves complex business problems. What investments best meet our risk criteria and income goals? What schedule for 2,000 employees maximizes production and minimizes labor costs? Should we borrow or use cash reserves to finance the expansion? Or virtually any other business problem.

The models IFPS/Plus uses to solve problems are described in English, not complicated spreadsheet formulas. So they're easy to understand.

Call for free information.

IFPS/Plus 3.0 is the newest mainframe version of decision software widely used by Fortune 500 companies. For our free information packet, call Phil Hand toll free at

1-800-531-5038.

(In Texas and Canada, call 512-346-4980.)

EXECUCOM

IFPS/Plus 3.0 runs in IBM, TSO and CMS, Digital VAX, Digital MICROVAX, PRIME and selected UNISYS environments.
IFPS/Personal is available for IBM PC's and compatibles.
Execucom, the worldwide leader in decision support software technology for over 12 years.

IBM exec

CONTINUED FROM PAGE 45

management software or the IBM Cabling System as dominant standards.

However, Allen clearly stated that Netview, running over Netview/PC, is IBM's "base for total network management," providing a comprehensive management system for multiple communications products and multivendor systems.

Strategic objectives

Allen outlined a communications strategy that included the following four key elements:

- Expand IBM's Advanced Function features.
- Publish architectures.
- Support international standards development.
- Implement accepted standards.

Strategic objectives include a full exchange of information between users, integration and enhancement of voice functions, optimization of network resources, interconnection of unlike entities and IBM's theme of end-to-end network control, he added.

The common thread linking these components is network management, Allen said.

Network management is so critical that it has become a key focus for IBM's continually evolving SNA, and the bulk of IBM's current software development efforts in Raleigh, N.C., are devoted to network management products, he added.

These tools will help MIS manage pieces of an enterprisewide network — for example, local-area networks and departmental systems.

Future SNA potential

But SNA will serve as a "standard approach" to network management, Allen said. Future capabilities of SNA reportedly will include enhanced fault tolerance as well as the ability to dynamically reconfigure an SNA network without taking the network down or off-line.

Allen cited another IBM goal under SNA: host-based network management. He assured MIS executives that IBM will not try to lock them into a host-based architecture but suggested host-based network management is "natural" for site control.

Third parties, as always, will continue to play a major role in IBM's network strategy, according to Allen. IBM wants users to have multiple sources of applications and information, as well as many connectivity options, he said.

© 1987 Hewlett-Packard Co. IS02710

we never stop asking "What if..."

Order HP Workstations. Save $1.89.

Bundled PC Workstation Solutions from Hewlett-Packard.

Buying workstations can be quite a headache.

Evaluating people's needs, surveying available components, ordering, testing and supporting them can turn into a time-consuming hassle.

But because we monitor the way people work with PCs, we've learned to configure and package—bundle together—the most efficient hardware/software combinations for the job.

Our HP Vectra PC workstations come specifically configured for secretarial, professional or desktop publishing needs.

They work in a networked environment. As your needs grow, they can be upgraded.

They're all IBM AT-compatible, and they're all available now.

So to choose the right workstations, all you have to choose is HP.

It's one more example of how the company that never stops asking "What if..." makes life easier and more productive for you. Call 1 800 367-4772, Dept. 282Y.

HEWLETT PACKARD

NEW PRODUCTS

Local-area network hardware

AST Research, Inc. has introduced **AST-220**, a multitasking controller said to allow IBM Personal Computers and compatibles to operate in the Digital Equipment Corp. environment as windowing VT220 terminals.

The AST-220 board provides a direct or remote connection between IBM PCs and DEC VAX or Microvax systems. The board comes with system software, providing a multitasking operating system with full windowing features. The windows provide concurrent access to two separate DEC sessions, a Microsoft Corp. MS-DOS session and two notepads.

Other features include two RS-232 ports, Columbia University's Kermit file-transfer protocol and Xmodem and several VT220 emulation features.

AST-220 is priced at $595.

AST Research, 2121 Alton Ave., Irvine, Calif. 92714.

Local-area network software

Gandalf Data, Inc. has unveiled the **AIM 2086**, an intelligent interface module for its Private Automatic Computer Exchange (PACX) networking systems.

The AIM 2086 is said to provide asynchronous devices with such networking capabilities as speed conversion, flow-control conversion and character-string disconnect. According to the vendor, the AIM 2086 allows the PACX systems to recognize a unique disconnect character string from the host and can support split speed conversion.

The AIM 2086 is priced at $1,900.

Gandalf Data, 1020 S. Noel, Wheeling, Ill. 60090.

Links

Eicon Technology Corp. has announced **Access/QLLC**, an IBM 3270 Systems Network Architecture/X.25 gateway for stand-alone personal computers and PCs connected to an IBM Netbios-compatible local-area network.

The gateway is said to provide connections to IBM hosts equipped with the X.25 Network Control Processor Packet Switching Interface or equivalent and those hosts supporting the 3270 Display System Protocol by emulating IBM 3274 control units.

PCs are connected to the X.25 packet-switched data network via a dedicated line or through an X.25 dial facility over a standard telephone line.

Access/QLLC is priced from $1,495.

Eicon Technology, 3452 Ashby St., Montreal, Quebec, Canada H4R 2C1.

Protocol converters

Simpact Associates, Inc. has announced the **CPI 10000** family of Binary Synchronous Communications (BSC) protocol interfaces for Digital Equipment Corp. computers.

The family consists of four products said to implement the IBM 2780/3780, 3270, Hasp and financial market data feeds protocols. Each product includes the protocol software; a multiport, front-end, intelligent communications processor; a distribution panel kit; and user documentation. The protocol software runs on the communications processor.

Versions are available for DEC's VAXBI, Q-bus and Unibus systems. Prices range from $5,300 to $10,500.

Simpact, 9210 Sky Park Court, San Diego, Calif. 92123.

File servers

Omnicom, Inc. has announced **Osilogie/PC**, an IBM Personal Computer AT-specific version of its portable Open Systems Interconnect (OSI) software.

Osilogie/PC is said to participate in open environments compatible with Technical Office Protocol specifications. The package off-loads the OSI communications function from the PC, allowing the PC to handle other applications. Files can be transferred between systems while application processing continues.

Osilogie/PC comes with the necessary hardware to attach the AT to an Ethernet local-area network. It operates as a front-end protocol processor featuring 512K bytes of random-access memory.

Osilogie/PC costs $1,995.

Omnicom, 115 Park St. S.E., Vienna, Va. 22180.

Modems/Multiplexers

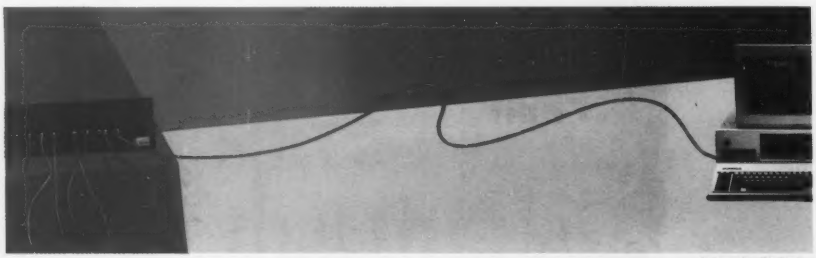
Equinox Systems, Inc. has announced the **LM-48 T1 Local Multiplexer**, an enhanced version of its LM-48 Local Multiplexer.

The enhanced version is said to allow users to send 48 channels of data over a T1-compatible link. The link may consist of two twisted-pair cable microwave facilities or fiber-optic lines that support unformatted T1 transmission at 1.544M bit/sec. All 48 channels can transmit data at speeds up to 19.2K bit/sec.

Other features include the menu-driven configuration and diagnostics. LM-48s connected by twisted-pair cable can be separated up to 6,000 ft.

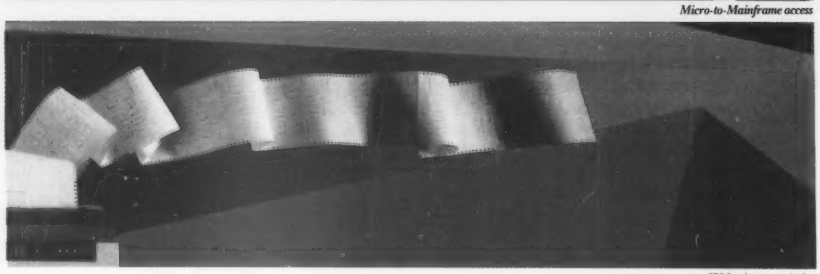
The LM-48 T1 Local Multiplexer costs $3,100.

Equinox Systems, 12041 S.W. 144 St., Miami, Fla. 33186.



On-premise distribution

Micro-to-Mainframe access



IBM printer emulation

Which Adacom Do You Need?

If you're a manager in a 3270 environment Adacom has something you need.

Economical solutions.

Are you relocating or expanding and need a flexible way to grow within your current 3270 system? Adacom can help you with innovative fiber/coax/twisted pair cabling system for more efficient on-premise device distribution.

Perhaps you need a fast, inexpensive way to create a PC-to-mainframe link. Adacom can show you how.

Maybe you just want to replace expensive printers with lower cost ASCII printers, or add new printers and increase printer productivity.

Adacom has a simple way to do it.

If you're looking for low cost ways to expand and improve, Adacom has the answers.

We have the products you need. The skills and knowledge it takes to make them work. And, we do it better and more efficiently than anyone else for one very simple reason.

Adacom specializes in connectivity solutions.

For a complete description of all the cost efficient ways Adacom can help you add to your 3270 network, call or write today.

We have what you need.

ADACOM

Connectivity solutions that really work.

8871 Bond St., Overland Park, KS 66214
913-888-4999, 1-800-3270ADA

There's only one way to keep on top in the terminals business.

Keep on topping yourself.

File Tools Selection Patterns Font Style
Paint Info...
Calculator
Clock
Print Spooler
C:\GEM\APPS\IMAGES\SHORTCUT.IMG
Executes the
Hold down while
the pixel you
complement color.

Presenting the Wyse WY-60.

It's a better ASCII terminal. A better ANSI terminal. And a better PC terminal.

The WY-60 has multiple personalities, but character that's singularly Wyse. It's the best example yet of the ingenuity and attention to detail that put Wyse on top in the first place. A terminal designed to work better, above all, for the people who work with it.

Consider how it works better for their eyes. Sharp 10 x 16 characters create extraordinary resolution. Since lighting and taste vary, so do our selection of screen colors.

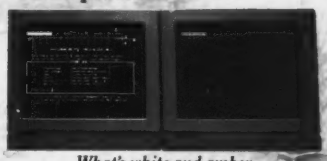
Now consider how the WY-60 works better to organize data. Its 132-column x 44-line format displays an entire spreadsheet. We give you double-high, double-wide characters for headings and high-lighting. A 512-character soft-font to download specialized symbols and graphic images. And hidden attributes to simplify displays and save screen space.

And the WY-60 fits into most any environment. It emulates 20 different personalities, from IBM-PC to Unix and the DEC VT-100.

So no one has to re-learn a keyboard, you can choose from five popular layouts: ASCII, ANSI, IBM Enhanced PC, IBM AT, or IBM 316X. Each keyboard features the precise and resilient feel perfected by Wyse for more efficient touch typing. And because people simply love it.

No small consideration. People simply live working with the WY-60. They like its looks. The ease with which it tilts, swivels or elevates. They appreciate WyseWorks, our built-in calculator and ASCII table. And Wordstar users enjoy the reduced key strokes our integrated Wyseword firmware provides.

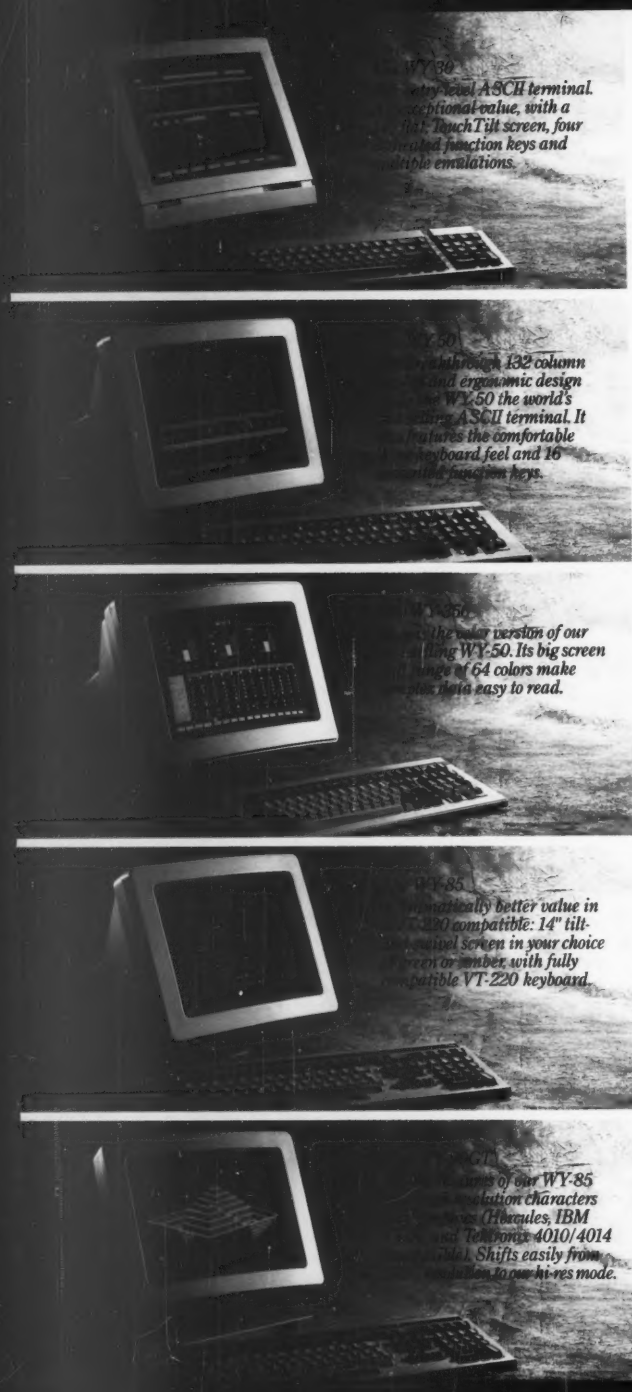
Our optional arm elevates your point of view.



What's white and amber and green? The WY-60's screens.

The WY-60 is as comfortable to invest in as it is to work with. With quality backed by the company that ships more terminals than anyone but IBM, and the most comprehensive service and support program in our industry.

The decision: which of the WY-60 layouts is right for you.



The top line.

You're looking at five of the reasons Wyse ships more terminals today than anyone but IBM.* But the most important reason of all, we think, is the way we build every one of our terminals. Virtually from the ground up. With unwavering insistence on reliability, value, and integrity of design. No short cuts. No compromises. Because we know the best way for you to get more work out of a terminal is for us to put more work into it. And that increased productivity is the most important value of all.

Call today or mail the coupon. And see what the terminal industry's top line can do for your bottom line. **1-800-GET-WYSE.**

*IDC 1986 U.S. Terminal Census.

___ Yes, please send me detailed information on the WY-60 and the entire Wyse product line.
___ I'd like to see a demonstration of the WY-60.

Name_____
Title_____
Company_____
Phone_____
Address_____
City_____ State____ Zip____

Mail to: Wyse Technology,
Attn: Marcom Department 60-4p
3571 N. First Street, San Jose,
CA 95134

WYSE

We make it better, or we just don't make it.

HARD TALK

James Connolly

Pictures less than perfect

Think of the recent Association for Information and Image Management (AIIM) show as a visit to an automobile dealership. Potential customers were kicking tires, comparing prices and taking test drives. But few seemed ready to load in the kids and the sleeping bags for a dream vacation in the mountains.

In the computer business, a test drive usually means trying out a technology on a single application. The drive to the mountains means a full-scale, networked corporate commitment with all attendant risks.

It was apparent that many of the attendees at the AIIM show were shopping for their first optical-disk storage systems, which were key elements in most major vendors' displays. The shoppers were looking for ways to store and manage documents, such as contracts and computer-aided design drawings that now occupy thousands — sometimes millions — of frames of microfiche or sheets of paper in large corporations and government agencies.

Continued on page 56

80386 powers Sequent CPUs

High-speed Symmetry line marks shift from National Semi's 32032 chip

BY STANLEY GIBSON
CW STAFF

PORTLAND, Ore. — Sequent Computer Systems, Inc. is expected to more than triple its minisupercomputer performance today with the introduction of parallel processing systems based on the Intel Corp. 80386 microprocessor.

The Symmetry series consists of the S27, which uses from two to 10 processors to perform up to 27 million instructions per second (MIPS), and the S81, which performs up to 81 MIPS using up to 30 processors. Prices range from $89,000 to $800,000.

The new systems represent a shift to the 80386 chip from the National Semiconductor Corp. 32032 chip, which Sequent uses in its Balance series of parallel processing machines. The Balance series consists of the 8.4-MIPS B8 model and the 21-MIPS B21.

Portability maintained

Despite the use of different processors, Sequent's Unix-based applications are portable to the new systems, according to Sequent officials. In addition, a Balance system can be upgraded to a Symmetry system by swapping boards, installing Sequent's Dynix Version 3.0 and recompiling applications.

However, some earlier Balance systems will require an additional upgrade to the recently available high-performance parallel disk controller. The Symmetry and Balance systems can reportedly support from 96 to 256 direct terminal connections.

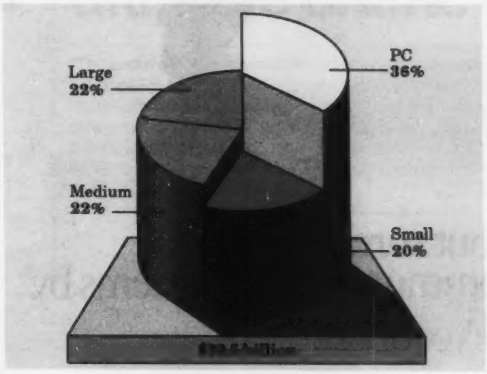
"We wanted to ensure that current customers could migrate easily to the more powerful systems, if they wished, while main-

Continued on page 55

Data View

Technologies vie for markets

PCs reach 36% mark in $39.5 billion U.S. market in 1986



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART: SUSAN ALDAM

Qantel's mini leap

BY STANLEY GIBSON
CW STAFF

HAYWARD, Calif. — Boosting its entry-level multiuser systems, MDS Qantel, Inc. announced last week the System 43, a minicomputer that can handle 12 to 15 users.

The System 43 follows by two months the announcement of the System 15, an IBM Personal Computer AT-compatible multiuser system. Both systems are part of MDS Qantel's attempt to sell to first-time buyers. The System 43, however, is also designed as an upgrade for

Continued on page 55

Access key to growth of supers

BY JAMES CONNOLLY
CW STAFF

SANTA CLARA, Calif. — The need for all technological elements to grow together, the need to increase CPU power and training future supercomputer scientists were key concerns for more than 1,000 attendees at the recent International Conference on Supercomputing.

Speakers at the conference, which was held in conjunction with the World Supercomputer Exhibition, said the supercomputer industry will continue to grow, particularly as supercomputers move into private industry. However, the same speakers warned that much of the growth depends on continued federal support of university supercomputer centers.

The exhibition provided minisupercomputer vendors and a few supercomputer makers with the opportunity to display current products and to demonstrate future technologies. Also on the show floor, university supercomputer centers solicited time-sharing clients for their ex-

Continued on page 56

Inside

• SBE unveils Multibus I additions. Page 57.
• Intecolor adds 19-in. color graphics terminals. Page 58.

140 MVS INSTALLATIONS SAVE TIME AND MONEY WITH BETA SYSTEMS' OUTPUT MANAGEMENT PRODUCTS. YOURS CAN TOO.

BETA 91 — ABSOLUTE CONTROL™ Automated Balancing System. Eliminate manual balancing. Take totals from anywhere in existing reports, compare to totals from other reports, with no application changes! Or, call from within programs if desired. Maintain record counts, Volume Serial Numbers, any other application or MVS System information. Catch errors as they occur, prevent release of successor Jobs. Include automatic checks and balances to protect against errors, fraud. Assists in restart recovery. Save people time, speed application processing, reduce reruns, ensure accuracy with **ABSOLUTE CONTROL.**

"Implemented better controls than we had with manual checking. We don't even print balancing reports anymore. Production Control doesn't get involved unless there's a problem. Since we got **ABSOLUTE CONTROL** *we don't have nearly as many errors, and the ones we do have are usually easier to track down and correct."* — DP Manager, Large Bank

BETA 92 — OSCAR™ Online SYSOUT Control, Archival, and Retrieval System. Online compression, browsing of SYSOUT. Flags errors like bad condition code, not cataloged, user defined conditions. Print only required portions of JCL, lists, reports. Automatic compressed archival to offline media, microfiche. Powerful selection criteria allow quick and easy retrieval, display, printing of historical lists for problem determination, audit trail, or to avoid reruns. Save paper, printers, people time, storage, reduce reruns – take control of MVS SYSOUT with **OSCAR!**

"We've eliminated all the headaches of manually decollating, checking, storing, and disposing of SYSOUT. Plus, we're saving $3,000 a month on paper. The best part, though, is that now we can find SYSOUT from Jobs that ran weeks or even months ago when we need to." —Operations Manager, Major Manufacturer

BETA SYSTEMS SOFTWARE, INC. • 1485 Enea Ct., Suite 1333 • Concord, CA 94520 • (415) 682-8715

Mail to: BETA SYSTEMS SOFTWARE, INC.
1485 Enea Ct., Suite 1333
Concord, CA 94520
(415) 682-8715

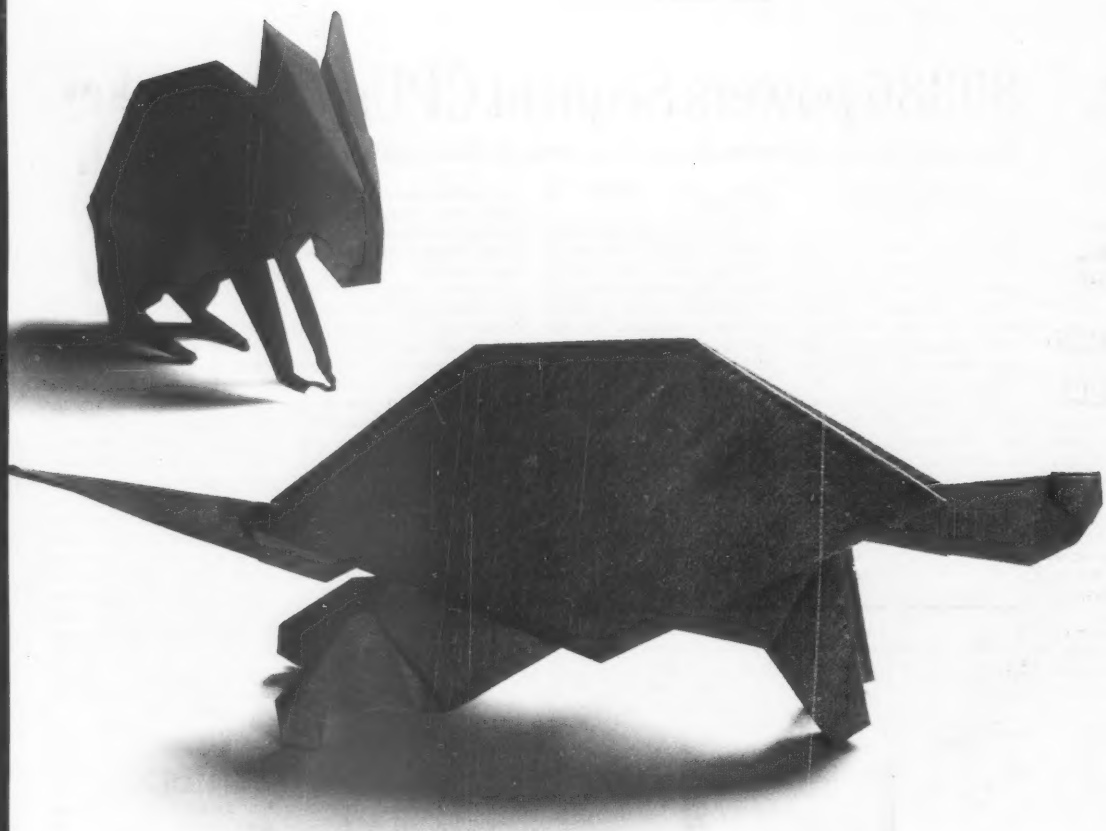
Please send me more information:

☐ ABSOLUTE CONTROL™
Automation Balancing System

☐ OSCAR™
Online SYSOUT Control, Archival and Retrieval System

Name_____
Title _____
Company _____
Address_____
City_____ State____ Zip_____
Telephone (____) _____
CPU Make & Model _____ OP SYS _____

© 1987 AT&T



Slowly but surely, ISDN will pass today's communications systems by. All except one.

Large companies are looking for a voice and data system that grows more valuable every day. AT&T Comes Through.

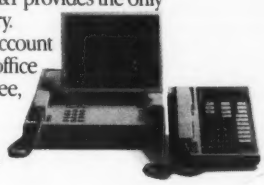
The changes in AT&T's System 85 aren't much to look at: a new circuit here, a new interface there, and new software all round. But the *results* will be as plain as the numbers in an annual report.

Result: New features will make it easier for your people to do business – and for others to do business with you.

Result: A new ISDN interface can unite voice and data products made by different vendors in a single company-wide network, reducing your need for single-purpose lines.

Result: As the new ISDN technology advances, today's AT&T System 85 will be your gateway to *any* ISDN-ready system *anywhere*.

As you read this, AT&T people are quietly helping create the ISDN standards that will vastly simplify data communications around the world. You can expect AT&T's System 85 to keep pace. It is no accident that AT&T provides the only written upgrade policy in the industry.



To learn more, contact your AT&T Account Executive. Or, for the number of our office nearest you, please telephone, toll-free, 1 800 247-1212.

From equipment to networking, from computers to communications, AT&T comes through.

AT&T
The right choice.

Sequent CPUs

CONTINUED FROM PAGE 53

taining all their investments in software, packaging, peripheral hardware and actual data files," said Stephen Verleye, Sequent's software marketing manager.

Jeff Canin, a supercomputer analyst with Hambrecht & Quist, Inc. in San Francisco, said the use of the Intel chip would bring to Sequent a library of 80386-based applications. "The enormous desktop PC base of applications will convert easily to 386 parallel processors," he said, adding that "as they [Sequent] move from technical to commercial [applications], the 80386 chip will play better." Canin said Sequent's architecture is better suited to commercial, rather than scientific, applications.

Omri Serlin, president of Itom International, Inc. in Los Altos, Calif., downplayed the significance of the chip itself, saying the use of a new hardware platform was not a key issue and would have little effect on a user moving software from a Balance to a Symmetry system.

David Rogers, Sequent vice-president of technology, said his firm will continue to build and sell the Balance series. He did not rule out the possibility of moving to a non-80386 microprocessor — possibly the next National Semiconductor chip, should that company leapfrog the competition.

"We want to use the most successful and powerful processor," Rogers said.

> "AS THEY [Sequent] move from technical to commercial [applications], the 80386 chip will play better."
>
> JEFF CANIN
> HAMBRECHT & QUIST, INC.

The key difference between the Balance and Symmetry systems is that the National Semiconductor 32032 chip can perform 0.8 MIPS, while the Intel 80386 can perform 3 MIPS, he said.

Each Symmetry processor board contains two fully independent CPU subsystems. Each CPU subsystem, in turn, consists of a 16-MHz 80386 microprocessor; an 80386 floating-point unit; a 64K-byte, two-way set-associative cache; and 64-bit bus-interface logic. An optional floating-point processor based on the Weitek Corp. 1167 chip set can be configured with each CPU.

According to Sequent, the floating-point unit performs up to 14 million floating-point operations per second and could make the system attractive to users performing simulation, artificial intelligence, financial modeling, manufacturing automation and computer-aided design and engineering.

The Sequent S27 — with 10 CPUs, a maximum of 80M bytes of main memory and 4.3G bytes of disk storage — is priced at $400,000.

The Sequent S81 — with 30 CPUs, 240M bytes of main memory and 17.3G bytes of mass storage — costs $800,000.

The Symmetry systems reportedly will enter beta testing in July and be available in volume in September.

Sequent also lowered the price for its B8 system and announced peripherals and operating system enhancements for its current Balance systems.

Qantel

CONTINUED FROM PAGE 53

users of the System 15.

"The System 43 fills in the low end of our product line and augments our strategy of reaching out to entry-level and first-time computer users," MDS Qantel President Karl H. Niemuller said.

The minicomputer runs the BEST/AOS operating system and supports all the application software developed by value-added dealers to run on other MDS Qantel systems. Among the packages available for the System 43 are the Qantel Manufacturing Resource Planning software, the Qantel Advanced Retail System and the company's Hotel and Leisure package. The System 43 comes with a ¼-in. streaming tape drive and an open I/O slot for a communications, printer or terminal controller. The System 43 can contain up to 1M byte of main memory and can support disk capacity of 45M, 75M or 160M bytes, the vendor said.

A System 43 with a 45M-byte drive and one terminal is priced at $14,740.

The System 43 and 15 are MDS Qantel's answers to the competitive challenge posed by AT-based systems. "The System 43 and the System 15 give our customers and our dealers competitive alternatives to the single-user PC AT-based systems that have come to dominate the low end of the market," Niemuller said.

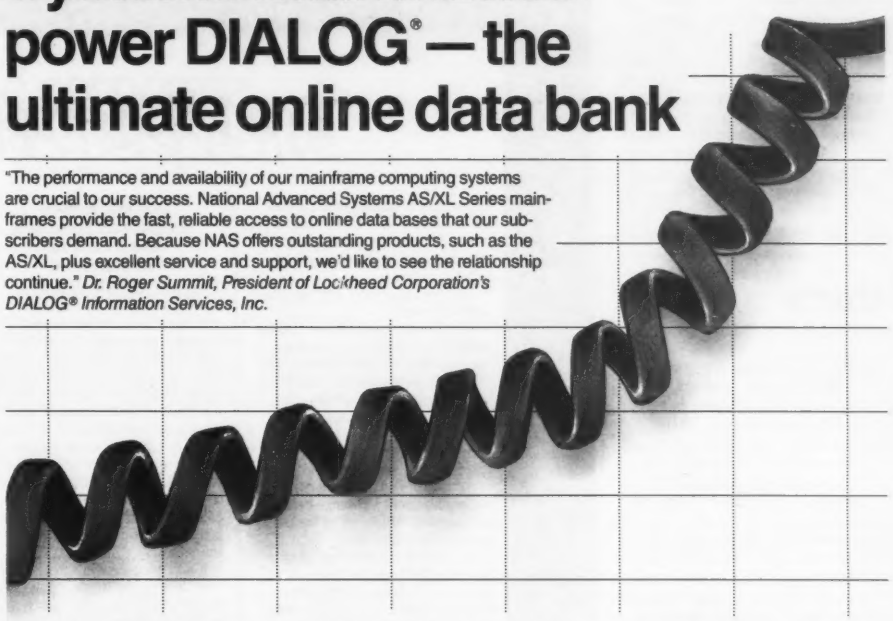
In addition, Qantel announced the System 45XP, which replaces its System 45. The new machine is identical to the System 45 except that it runs the faster processor of the System 43.

The System 45XP can reportedly support up to 15 users and offers disk capacities ranging from 45M to 600M bytes. A system with a 75M-byte drive and one terminal is priced at $22,240.

National Advanced Systems

National Advanced Systems mainframes power DIALOG® — the ultimate online data bank

"The performance and availability of our mainframe computing systems are crucial to our success. National Advanced Systems AS/XL Series mainframes provide the fast, reliable access to online data bases that our subscribers demand. Because NAS offers outstanding products, such as the AS/XL, plus excellent service and support, we'd like to see the relationship continue." *Dr. Roger Summit, President of Lockheed Corporation's DIALOG® Information Services, Inc.*



Lockheed Corporation's DIALOG Information Services, Inc. provides the world's largest collection of online information. With over 120 million entries in more than 270 data bases, DIALOG is rightfully known as the ultimate online data bank. A few minutes online with DIALOG can retrieve data that would otherwise require hours of tedious search in a conventional library.

Mainframe computing is DIALOG's lifeblood. Over 80,000 subscribers worldwide rely on DIALOG to systematically access the world's knowledge base. DIALOG, in turn, relies on National Advanced Systems AS/XL Series mainframes and 7380 Disk Storage Subsystems for reliable, lightning-fast computing power.

DIALOG knows the value of peak mainframe performance from National Advanced Systems. But then knowledge is their business.

National Advanced Systems customers, such as DIALOG, buy our products because they perform. They keep them because we perform. Our mainframes and storage systems are renowned for quality and reliability unsurpassed in the IBM-compatible marketplace. We add to this exceptional value with a very simple feature. We listen. We work closely with you to provide innovative solutions that meet your unique requirements. We back up these solutions with the top-ranked service and support in the industry.

To get peak performance from your data center, write John Diedenhofen, Vice President of Marketing, MS 52, P.O. Box 7300, Mountain View, CA 94039. Or, call 415-962-6100.

The preferred choice of informed mainframe and storage systems users around the world

Supers' growth

CONTINUED FROM PAGE 53

cess supercomputing capacity.

Victor L. Peterson, director of aerophysics for the National Aeronautics and Space Administration, noted that the power of supercomputers increased by a factor of 10 during the past 10 years but that demands continue for more performance because scientists develop more sophisticated applications.

Larry L. Smarr, professor of physics and astronomy at the University of Illinois at Urbana-Champaign, said efforts at that school's federally funded supercomputer center are now focused on bringing all elements into balance rather than just building up the power of its Cray Research, Inc. supercomputer.

'Need more bandwidth'

"We want to bring the system into balance," Smarr said, noting that his university's work involves extensive use of images, which means dealing with units of 1M byte rather than single-byte units of number-oriented systems. "That means we need a lot more bandwidth to move those 1M-byte units around. The Cray becomes just a peripheral," he added.

In the keynote address, James F. Decker, deputy director of the U.S. Department of Energy's Office of Energy Research, stressed the importance of continued support for supercomputer efforts in universities.

"I believe the full impact of trained computer scientists is still a few years away," Decker said, adding that computer training efforts in the U.S., Japan and Europe are still not enough. Like Smarr, he noted that work still must be done in the area of communications. "Our goal should be to make a user's access to a supercomputer as good from hundreds of miles away as it is from next door."

Decker said a key to the growth of supercomputing has been the technology's drive into the private sector, particularly the aerospace field. But he also noted that one element that is missing is the development of supercomputer software, which users often have been unable to take on and vendors have often been unwilling to do.

Introductions

Product developments presented at the exhibition included the following:

- Honeywell-NEC Supercomputers, Inc. announced three models of the NEC-built SX 2 series.
- Saxpy Computer Corp. announced its Matrix 1 family of computers, which are designed to process numerical problems, such as those in signal processing, in a matrix fashion. Those systems use Digital Equipment Corp. Microvax II minicomputers as front-end processors and perform what Saxby claimed to be a peak rate of 1 billion floating-point operations per second (FLOPS) and a sustained rate of 700 MFLOPS in some applications.
- Cydrome, Inc. was one of several companies displaying unannounced products. Cydrome's Cydra 5 minisupercomputer reportedly is scheduled to be introduced during the summer. The Cydra 5, which is expected to be sold directly to end users and through Prime Computer, Inc., is based on data flow technology.
- Chopp Computer Corp. exhibited a demonstration unit of its Chopp 1, which the company expects to perform 200 MFLOPS when available in 1988.
- Control Data Corp. restructured its Equivalent System Processing service, which provides clients with access to CDC Cyber 205 and Cray X-MP/24 supercomputers. CDC officials said the service is now available at an effective cost of more than 30% less than before. Under the new structure, users can contract for a percentage of computing capacity, with flexibility in how that time is used during daytime hours, nights or weekends.

Under the new structure, a user gets 7.44 hours of CPU time, which is 1% of the time available, for $20,000.

Pictures

CONTINUED FROM PAGE 53

But many of these same attendees noted that the technology isn't quite ready to support an all-out move to electronic document management. So the shoppers gave serious thought to the products that can meet at least some of their needs and get them started with pilot programs, such as automating a single department's library.

There should be no doubt that electronic-image management is a field that may take off the way AIIM expects it to during the next decade. But important elements — particularly communications with installed MIS equipment and editing capabilities — are missing or inadequate in most of today's products. Those elements can only be developed with time, work and experience, much of it on the part of the people who went to the AIIM show with long-range ideas.

There is a wonderful concept of a bank converting a handwritten check to an electronic image that can be moved among departments as needed and stored through eternity at a cost of mere pennies. The check can be converted, stored and indexed today, but the ability to access that image on-line from the average terminal may be a generation away. The question that remains unanswered relates to just how long or short — in years or product cycles — that time will be.

Connolly is *Computerworld*'s senior editor, systems & peripherals.

The better you understand
the better your company c

The MIS perspective.

For years text management software has received scant attention from MIS.

Which is strange, considering how vital it is to some of the key people MIS has to serve.

Like the CEO plotting global competitive strategy.

For planners, strategists, and senior marketing executives, text management systems have proved their value repeatedly in recent years—delivering powerful bottom-line benefits, and creating a wave of demand that's headed right for you.

How do you prepare for this demand? Several ways:

First, make sure you understand text management software—before your users do. (Hint: we're *not* talking word processing.)

Second, select a text management approach that combines the features *users* need to obtain information—with the features *you'll* need to maintain system integrity. Users need specialized text search and reporting facilities conventional DBMS's don't offer; you need a new level of system controls dedicated retrieval systems don't offer.

And third, start evaluating text management systems and vendors without delay. You can begin that evaluation today with a look at INQUIRE/Text—the most comprehensive, proven text management software system on the market.

Text management: It's not word processing. And it's not data management.

Traditional corporate information systems do a great job managing structured data. Unfortunately, the information most needed by decision-makers is often unstructured—embedded in the text of documents such as letters, reports, and contracts. Because this material has traditionally been beyond the reach of online systems, access to it has been slow, tedious, and error-prone. Word processors and office automation systems, for all their other merits, have been practically useless in making the actual information content of documents available online.

A text management system fills this void by providing highly sophisticated facilities for online index, search, and retrieval of information in stored documents. With a text management system, users can pinpoint specific pieces of information within vast volumes of text—instantly. And once they've found the information, they can edit, combine, and report it with complete flexibility.

Traditionally, the biggest text management users have been in industries that are subject to extensive regulation and/or frequent litigation. Now others are taking advantage of the systems' capabilities for a broad range of corporate information management tasks. And high on the list of these tasks is competitive intelligence gathering for senior management.

The result has been a dramatic improvement in the quality of information available to decision-makers. And a dramatic increase in pressure on MIS to deliver text management capability.

INQUIRE/Text: The features users need. The control you need.

As the demand for text management capability has grown, so has the number of vendors claiming to provide it. But few of these vendors offer the features, the flexibility, and the track record of Infodata's INQUIRE/Text.

INQUIRE/Text's automatic indexing and powerful keyword search and retrieval facilities have set industry standards in text management for years. And INQUIRE/Text's capacity, ease of use, and flexible interfacing options have made it a hit not only with end users, but also the MIS personnel charged with implementing it. Finally, INQUIRE/Text's worldwide track record makes it comfortable for top management.

INQUIRE/Text. It's the first thing you need to know about text management. And the only text management software system you'll want to live with. ◆

INQUIRE/Text runs on IBM and compatible mainframes under MVS/TSO, MVS/CICS and VM/CMS.

NEW PRODUCTS

Turnkey systems

Keyboard Productivity, Inc. has introduced a laser disk-based keyboard training system called the **Laser Keytrainer.**

The Laser Keytrainer consists of a laser disk drive, a 10-in. color monitor and a control unit containing the vendor's keyboard training courseware on three 8-in. laser disks. The system offers freeze-frame capabilities.

The courseware was designed to increase keying-in speeds and reduce typing errors. It includes graphics and narration in a 30-hour self-paced format.

The Laser Keytrainer is priced at $6,900.

Keyboard Productivity, 6035 Bristol Pkwy., Culver City, Calif. 90230.

Processors

Dual Systems Corp. has announced the **VMEM-16MB** dual-port VMEbus memory board.

The board is said to provide 16M bytes of memory on one card and support for both VME and VSB bus interfaces. It employs dual-ported memory and is said to provide arbitration between the VMEbus and the VSB through recursively defined flow-control asynchronous-state machines. VME access time is said to be 230 nsec on reads and 180 nsec on writes. VSB access time is 220 nsec on reads and 200 nsec on writes.

Features include bytewide parity checking and 32-bit data paths.

The VMEM-16MB is priced at $8,995. A 4M-byte version costs $1,995.

Dual Systems, 2530 San Pablo Ave., Berkeley, Calif. 94702.

SBE, Inc. has added the **SBE 400, 450, 500** and **550** system packages to its Motorola, Inc. 68000-based Multibus I computer systems and has announced that AT&T's Unix System V is available on its board- and systems-level products.

The systems are built around SBE's MPU-20 single-board CPU, which features a 32-bit Motorola 68020, and runs at 12.5, 16.7 or 20 MHz. The SBE 500 and 550 packages include 1M byte of expansion dynamic random-access memory and the memory management required to support the multiuser and program development capabilities of Unix System V. The SBE 400 and 450 do not include the memory-management option.

Unix System V costs $1,300. The boards cost from $6,325 to $11,835.

SBE, 2400 Bisso Lane, Concord, Calif. 94520.

Micro Industries has introduced the **MIB II 186/110 Multibus II** development kit, consisting of the MIB II 186/110 intelligent I/O development board and software support for specific functions required in a Multibus II system.

The MIB II 186/110 I/O board is said to provide a general-purpose intelligent interface to the Multibus II parallel system bus. According to the vendor, it consists of a Motorola, Inc. 80186 microprocessor, an independent configuration processor, up to 256K bytes of erasable programmable read-only memory, up to 512K bytes of dynamic memory, a direct memory access controller, an interrupt controller, a serial communications port and a prototype area.

The MIB II 186/110 I/O development kit is priced at $2,000.

Micro Industries, 691 Greencrest Drive, Westerville, Ohio 43081.

CAD/CAM/CAE

Aries Technology, Inc. has released the **AT1110 Conceptstation,** a desktop computer environment designed for computer-aided engineering and manufacturing.

The AT1100 Conceptstation is based on the IBM Personal Computer AT. It features a 256-color, 1,024- by 770-pixel monitor, a three-button mouse and Aries proprietary software. Features include a geometric modeler with assembly modeling capability, a finite modeler, a design-rule processor, materials property management and a macro language.

It is said to support C and Fortran-77 compilers as well as Ethernet communications. Systems software includes Microsoft Corp.'s Xenix.

The AT1100 Conceptstation is priced from $21,850.

Aries Technology, 650 Suffolk St., Lowell, Mass. 01854.

Data Innovations, Inc. has announced a digital image recording system called the **Modelviewer Series DI-300.**

The system is said to output computer-generated designs to film. It offers up to 16.7 milllion simultaneous colors and can record on 35mm slides or instant color prints. According to the vendor, it connects directly to engineering workstations, computing platforms or system networks and operates independent of video red-green-blue signals.

The Modelviewer system comes with a film recorder, graphics processor, software interfaces, 35mm camera back, instant print camera back, autoprint back and processor for instant 35mm slides. Prices start at about $9,000.

Data Innovations, 323 New Boston St., Wilmington, Mass. 01887.

text management software, an handle the competition.

The corporate strategist's perspective.

The amount of information that must be factored into major corporate decisions is increasing every day. And few categories of information are as sensitive or time-critical as competitive intelligence.

Whatever its source, whatever its nature, competitive information can be vital one day—and virtually worthless the next. To be used successfully in the timing and execution of any new initiative, competitive intelligence must be both accurate and actionable—and available to you ahead of your competition. And there's no better way to turn raw information into actionable intelligence than through a centralized online system under INQUIRE/Text.

INQUIRE/Text: Making the most of both internal and external information.

Competitive information comes from many internal and external sources: correspondence and memos, articles in trade journals, press releases, financial reports. Assimilating this information and making sense of it in time to act requires sophisticated text management capability. And INQUIRE/Text provides that capability in a proven, cost-effective manner that meets the needs of corporate strategists as well as MIS.

With INQUIRE/Text, the full range of appropriate internal and external information (in both text and alpha-numeric forms) can be maintained online. Document searches can be conducted quickly and accurately, and people can share integrated, relevant information instantaneously—speeding decisions while minimizing potential errors due to faulty or incomplete information.

No wonder hundreds of companies are already using INQUIRE/Text to make the most of their opportunities. No wonder we're convinced it will work for you, too.

A system that pays dividends for many departments—including MIS.

For all its sophistication, INQUIRE/Text is easy for non-DP-oriented users to master. Which makes it especially powerful as a means of presenting strategic information to top management.

But these managers aren't the only ones who benefit from INQUIRE/Text. Many of the features that make INQUIRE/Text such a superior business intelligence tool also lend themselves to other uses in legal departments, regulatory affairs, marketing, the library—and not least of all, MIS itself.

The fact is, INQUIRE/Text is a perfect system for the online maintenance of an almost limitless variety of technical and non-technical documentation. With its large capacity and flexible database facilities (including automatic backup and recovery, usage monitoring and accounting, and multi-level security), INQUIRE/Text protects the organization's interests while serving the individual with unmatched flexibility.

So if you're looking for an intelligent approach to competitive intelligence, start your search with INQUIRE/Text. And finish ahead of your competition. ♦

INQUIRE®/Text: Text management that works for users. And for MIS.

INFODATA

Infodata Systems Inc.
5205 Leesburg Pike
Falls Church, VA 22041
(800) 336-4939
In Virginia and Canada, call (703) 578-3430.

Get a jump on the rest. Act today.

I'm interested in INQUIRE/Text. My application is _____.

Name _____

Title _____ Company _____

Address _____

City _____ State ____ Zip _____

Phone _____

Machine/operating system environment

CPU model _____

☐ MVS/TSO ☐ MVS/CICS ☐ VM/CMS

INQUIRE and Infodata are registered trademarks of Infodata Systems Inc. INQUIRE is covered by U.S. Patent Number 3670310.

Graphics systems

Applicon has introduced the **Applicon Graphics Workstation GW4790**, which is built on a standard Digital Equipment Corp. Microvax II CPU running standard IBM VMS.

The GW4790 supports the vendor's Bravo3 software and emulates DEC's VT100 and Tektronix, Inc. 4100 series graphics terminals, according to the vendor.

A basic configuration includes the Microvax II CPU, a floating-point coprocessor, a 19-in. 1,280- by 1,024-pixel screen providing 256 colors from a palette of 16.7 million, 5M bytes of random-access memory, a 140M-byte disk, a 60M-byte tape-backup unit, a tablet/pen graphics input device and the MicroVMS operating system.

The GW4790 is priced from $45,000 to $95,000.

Applicon, 4251 Plymouth Road, Ann Arbor, Mich. 48106.

Data storage

Brand Technologies has announced its **Series 8000** 5¼-in. Winchester disk drives.

The Series 8000 includes the Model BT8085 85.3M-byte drive using Modified Frequency Modulation recording and the Model BT8128 128M-byte drive with Relocating Link Loader recording. Both models offer the ST506/412 interface and an average access time of 25 msec. The drives incorporate a balanced rotary positioner that is driven by a brushless direct-drive motor with a dedicated closed-loop servo surface.

The Series 8000 disk drives are priced at $750.

Brand Technologies, 6140 Variel Ave., Woodland Hills, Calif. 91367.

Terminals

Intecolor Corp. has announced a series of 19-in. **color graphics terminals**.

The terminals are said to incorporate Intecolor's Autoranging power supply, which accepts AC power inputs from 97 to 250V and line-frequency inputs from 40 to 70Hz. The terminals are compatible with all previous models. They are available with ergonomic, rack-mount or open-chassis packaging.

The 19-in. terminals are priced from $3,295.

Intecolor, 225 Technology Park, Norcross, Ga. 30092.

General Business Technology, Inc. has announced the **GBT 7710DS**, an IBM System/34-, 36- and 38-compatible display station.

The 7710DS is said to feature an IBM 3180-style keyboard, programmable mouse, zoom, printer controller modules and connection to the System/34, 36 and 38 via twinaxial cable. It offers a 14-in. display with a 12- by 12-in. footprint and either a green or amber screen. The user can store up to 3,947 char. in any of 24 memory locations and play them back on demand, the vendor said.

The GBT 7710DS display station is priced at $1,550. The mouse is priced at $50, and the printer controller modules cost $450.

General Business Technology, 1891 McGraw Ave., Irvine, Calif. 92714.

Printers/Plotters

Calcomp, a subsidiary of Lockheed Corp., has reduced the price of its **1042GT** pen plotter.

The 1042GT is an eight-pen model said to plot on A- to E-size cut-sheet or roll-feed media. Calcomp also announced price reductions for monthly maintenance charges on its entire line of 1040GT pen plotters.

The 1042GT is now priced at $9,900. The monthly maintenance charge for the 1041GT, 1042GT and 1043GT is now $25. The monthly maintenance charge for the 1044GT is $35.

Calcomp, 2411 W. La Palma Ave., Anaheim, Calif. 92801.

Power supplies

Condor, Inc. has announced the **International Series II** line of linear power supplies.

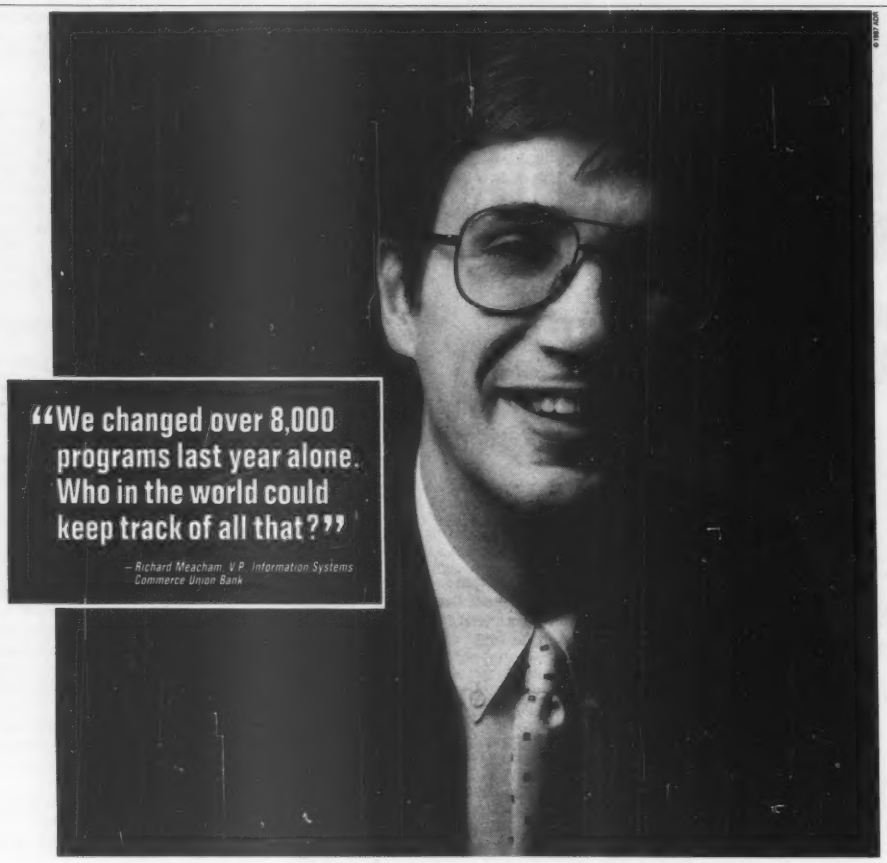
The International Series II includes 52 models that have passed international safety standards as well as FCC/VDE Class B specifications review. Twenty-six of the models meet UL544 standards.

The series features a split-bobbin design for isolation between the primary and secondary. Single-, dual- and triple-output models are offered.

Output voltages range from 2 to 28V. The linear power supplies were designed as form-fit-function drop-in resplacements.

Prices range from $27 to $153.

Condor, 2311 Statham Pkwy., Oxnard, Calif. 93033.


"We changed over 8,000 programs last year alone. Who in the world could keep track of all that?"
– Richard Meacham, V.P. Information Systems Commerce Union Bank

It must have been a programmer who said the only thing that remains constant is change. No sooner is a program completed than changes get made. And so many get made so often that staying in control of it all can be more than humanly possible.

That's why thousands of companies like the BASF Corporation, Giant Food Inc. and Commerce Union Bank let ADR/The LIBRARIAN® do it for them.

Commerce Union's programmers now have a complete history of every program in their inventory, including every change, available instantly. And generated automatically.

While The LIBRARIAN's Change Control Facility helps make sure every program change is properly completed, tested and documented. And meets audit requirements.

And The LIBRARIAN's unique architecture can do it using a fraction of the resources other systems use.

ADR® has the people and the experience to help you get the most from The LIBRARIAN. From pre-installation consulting to training to a worldwide support network that solves most common problems over the phone.

To learn how The LIBRARIAN can unlock the potential of your people and computers call 1-800-ADR-WARE.

ADR PERFORMANCE SOFTWARE. Unlock the potential.

ADR AN AMERITECH COMPANY

Applied Data Research, Inc. Orchard Road & Rt. 206, CN-8, Princeton, NJ 08540 1-201-874-9000

Help build the

arc

Association for Retarded Citizens

EXECUTIVE REPORT

THE COBBLER'S CHILDREN

Do vendor MIS shops use what their companies sell?

BY MICHAEL SULLIVAN-TRAINOR

A few years ago, Wang Laboratories, Inc. advertised its WP Plus software as the best word processing package on the market. The company's own employees, however, were still using the old OIS office automation software.

"They couldn't use WP Plus because they didn't have VS systems, and it was very difficult to install the new software on the old systems," says consultant Andria Rossi, a former Wang employee.

Until recently, many vendors tended to discount their internal computer support as a necessary but relatively unimportant area. Because it did not contribute directly to selling products, vendor MIS organizations often received discarded equipment and were awarded a low status in the corporate hierarchy.

Today, vendors voice a different attitude. Just as their customers are trying to develop applications that contribute to business success, computer companies are looking to their internal information systems organizations to assist other divisions in developing, enhancing and marketing products.

"In other computer companies where I worked, internal MIS was much more of a backroom activity than it is here," says William Stella, vice-president of MIS for Prime Computer, Inc. in Natick, Mass. "In those days, MIS groups were almost the cobbler's children — we always used to get secondhand equipment. It was amazing to look around and think, 'I work in a computer company. Why can't I get this equipment?' "

Because the trend is toward making the most out of internal computer resources, vendor MIS organizations are receiving the latest equipment so they can act as alpha- and beta-test sites — as well as become showcases — for the company's products.

For example, MIS executives at Wang are finding that product developers are listening more closely to their technical observations.

"We are more involved in tests and acting as beta sites for both operating systems and equipment than we ever have been," says Steven Nezer, senior director of Wang's information systems development.

The Wang information systems department was the alpha-test site for the Wang Imaging Information System announced in late April, and it has operated the system in a pilot mode since January.

"Those things never happened three years ago. We heard about things in the paper or through internal releases after they became well known," Nezer says. "Now, we do not release operating systems unless we use them ourselves first."

Driving this new vendor attitude toward MIS is the recognition that the vendor's in-house systems strongly resemble customer sites and that their internal users may be the most sincere sales representatives for the company.

"Vendors have realized internally that their employees are their own best marketing people," Rossi says. "They give the latest equipment to their

ROB SUNDERS

Sullivan-Trainor is a *Computerworld* senior writer.

INSIDE

Big green for Big Blue
Page 62

Rapid growth challenges DEC
Page 64

Cullinet changes its tune
Page 68

We don't service. We offer we're the

Computer service is more than good intentions. It's good organization.

To be sure we're there when you need us, we've set up a worldwide customer service and support system called TotalCare.™ It's a complete, comprehensive system.

All it takes to put the resources of Honeywell Bull into motion is a single call to our National Response Center, open 24 hours a day. Here, all historical data on your system is instantly available.

If necessary, you can call one of our Technical Assistance Centers, which are staffed by hardware and software diagnosticians. We also maintain a nationwide on-line parts stocking system to locate and ship whatever you need, fast.

Customers are more imp

t offer

r: You call,
ere.

Does your present computer company consider training part of good service? We do. We also offer a Customer-Assisted-Maintenance-Program for greater flexibility and economy.

Customers and computers. We take excellent care of both.

For more information on TotalCare, call 1-800-328-5111, ext. 2716. Or write: Customer Service Division, Honeywell Bull Inc., MS440, 200 Smith Street, Waltham, MA 02154.

Honeywell Bull

portant than computers.

Vendor MIS

FROM PAGE 59

employees for the same reason they donate systems to schools — to have these people become accustomed to their products."

The interest in having internal operations play a role in marketing buttresses vendors' traditional bias toward using the company's own equipment.

At Unisys Corp., the internal MIS environment is based on the product lines of what were Burroughs Corp. and Sperry Corp. Before the merger, both companies hosted long-standing policies of using their own equipment, says Allan Jones, vice-president of MIS at Unisys.

The company operates a number of mainframe-based data centers. One of the largest is located in Detroit — the former Burroughs headquarters — and another is in Blue Bell, Pa., Sperry's former headquarters.

"In both pre-merger worlds we were used as showcases," Jones says. "Both companies' data centers were highly visible as computing centers and networks. Customers would come and see what we do. That is still the case."

Staying within bounds

Although internal MIS has been reorganized along functional lines and brought under the control of a central staff, the computing environments remain separate but equal, Jones says.

MIS stays within the bounds of Unisys systems, implementing either Burroughs or Sperry products according to need.

In the applications environment, both Burroughs's Link and Sperry's Mapper applications development packages are used extensively.

Mixtures of the two product types are expected to occur as new applications are developed by Unisys, Jones says.

For the vendor MIS manager, the requirement of using the company's equipment comes with advantages as well as drawbacks.

Limited options

Because the MIS department obtains such equipment at a discount — close to cost in some cases — it gains ample resources to achieve its mission. But MIS employees may find themselves stretching their own equipment to solve a problem that could be more easily solved with another vendor's system.

About three years ago, Digital Equipment Corp. fell victim to this policy, according to George Colony, president of Forrester Research, Inc. At the time, President Ken Olsen boasted that DEC was the only Fortune 1,000 company without an IBM mainframe.

"They [DEC] reported that they would have OK earnings, and the earnings, in fact, were much lower than expected," Colony says. "That glitch apparently resulted because they could not compile quickly enough their order-entry systems from around the world using the VAX architecture."

Belford Cross, DEC's director of information systems, disagrees, saying that the earnings report issue was a planning problem, not a capacity problem.

Currently, DEC runs an IBM mainframe for connectivity development projects, but the company still relies on its own processors for business applications (see story page 64).

Another vendor with an unwritten policy of not buying products from outside vendors is SAS Institute, Inc., a Cary, N.C., software company. The MIS organization uses SAS products exclusively for internal applications, according to MIS manager Suzanne Gordon.

"We do everything with SAS software — accounts receivable, payable, contract processing,

Continued on page 65

Staying close to home

Vendors' MIS organizations often have unwritten rules that they must use the company's own equipment. Such policies benefit marketing objectives and limit system flexibility.

Advantages

- The vendor's own equipment is often available at a substantial discount, close to cost in some cases.
- Internal MIS departments become showcases of the vendor's equipment, demonstrating to customers what can be done with the systems.
- Programmers and analysts working to meet internal needs sometimes come up with systems that can be adapted to meet customers' needs.
- A company's own employees become familiar with its products and operate as a subtle marketing force.

Disadvantages

- Vendor MIS managers may be forced to implement systems that are not quite appropriate for a particular application because the company does not provide a product to meet the need.
- Managers have difficulty obtaining a system from an outside source to perform a specific function.
- Internal MIS departments must sometimes wait until the new release of a product is available rather than implement an outside package that would work just as well.

CW CHART

IBM invests in MIS despite slowdown

BY GLENN RIFKIN

Consider this: IBM spends more on its MIS function — $3.3 billion annually — than all but 123 companies in the Fortune 500 produce in total revenue. During the past five years, internal MIS has taken 10% of all IBM production for use in-house. Fully 7%, or 30,000, of the company's employees work directly for MIS worldwide. And while the computer industry slump forced major cutbacks within MIS as well as throughout IBM, the MIS budget continues to grow at 18% annually.

"We're here to provide IBM with a competitive advantage," says Anne-Lee Verville, IBM director of information and telecommunications systems and the top MIS executive. "If our technology didn't do that, we'd stop investing in it, and we're continuing to invest heavily in it."

For Verville, who recently assumed her post, and A. Donald Rully, IBM's director of information systems, the task of implementing that investment is vast. For example, more than 330,000 IBM employees are tied into a worldwide office system predominantly based on a 370 VM system running IBM's Professional Office System (Profs). There are, Rully estimates, an average of 1.6 display screens for every IBM employee in the U.S., totaling more than 380,000 screens.

Rully oversees the corporate headquarters staff of 425 employees. All other information systems departments are set up in an autonomous, decentralized mode throughout the corporation, each reporting to the general manager of that particular function or geography. While retaining dotted-line responsibility for the entire MIS operation, Rully's influence goes only as far as setting guidelines and corporate standards.

Like other MIS directors within a vendor environment, Rully does not bear the burden of vendor selection. His world is IBM-dominated and, although he has the advantage of getting all his equipment at cost, he insists there are strong challenges within that environment.

"Don't ever kid yourself that our internal measurement system is any different from any other corporation," Rully says. "We don't do funny things with blue dollars vs. green dollars. When we measure a general manager, he is measured on how he uses IBM equipment just as he would be for any other capital equipment acquisitions."

Rully points out that internal MIS has the advantage of being a beta-test site for virtually all new IBM products, but that advantage does not extend to actual delivery of quantities of new products. "Then we have to be in the same queue as the rest of the customer set," he says.

Verville and Rully *of IBM*

As IBM's largest customer, the information systems department generally gets what it wants. There are times, however, when an unexpectedly high demand from outside customers will force the internal users to wait. "We will haggle if we feel we need the product as much as an outside customer," Rully says. "But we make trade-offs all the time. If we're asked to slip, we'll ask the entire information systems community to see who can afford to take a slip in terms of delivery date. Generally, we can come to an agreement."

For IBM, the information systems function also serves as a technology showcase. Not only does information systems formally review new products, but it plays a strong role in marketing and customer contact. For example, the corporate headquarters staff is currently involved in a marketing-sponsored program called End-User Fly In, in which a half-dozen IBM customers will be brought in for a full-day tour and briefing about how and why Rully's group does what it does.

Time spent on marketing is limited, however. MIS at IBM, perhaps even more than at other corporations, is expected to seek out applications that produce a strategic advantage. That task is complicated by the sheer size of IBM. A major effort is required in order to have an impact on a $50 billion company.

"From a corporate-staff point of view, we're constantly out there looking for those kinds of applications, but most of them are generated out in the line organizations," Rully says. An example of such an MIS-generated application is a hand-held microcomputer and digital radio now used by the service engineers. With the micro, engineers in the field can input data about what service they provided to a central data base and can relay questions to the central service office while in the field.

"It saves a lot of money, and in terms of productivity, service people can make more service calls than they could previously," Rully says. MIS is also at work connecting the company's vendors and suppliers to IBM through information systems and telecommunications systems.

The major MIS contribution is the office network that connects a major portion of the company. According to Rully, it has literally changed the way IBM does its internal business. The major operating system for the network, Profs, was developed within MIS and eventually became an IBM product.

Though IBM's MIS function continues to grow, it has, with the rest of the company, been hit by the recent downturn. Rully admits that anywhere from 5% to 10% of the information systems work force has been transferred to sales and marketing functions. In addition, information systems has tightened its belt, like every other organization in the business. Rully is keeping close tabs on the overall effect of the slump, however.

"Operational performance has not been degraded by the expense cuts to date," he says. "But there is no doubt that delivery of new applications and services were traded off, at least in terms of schedule, due to the expense cuts."

Verville is clear on both the advantages and disadvantages of being internal MIS for IBM. The executive management team, she points out, understands as well as any corporate management group the advantages of technology and, she says, it truly believes in investing in technology to gain strategic advantage.

On the downside, however, is the old adage that a little knowledge can be a dangerous thing. "Everyone here is an expert," Verville laughs. "They can drive the implementors crazy."

"The users are just as impatient as we are," Rully adds. "And they drive us as fast as they can." •

Rifkin is a senior editor at *Computerworld*.

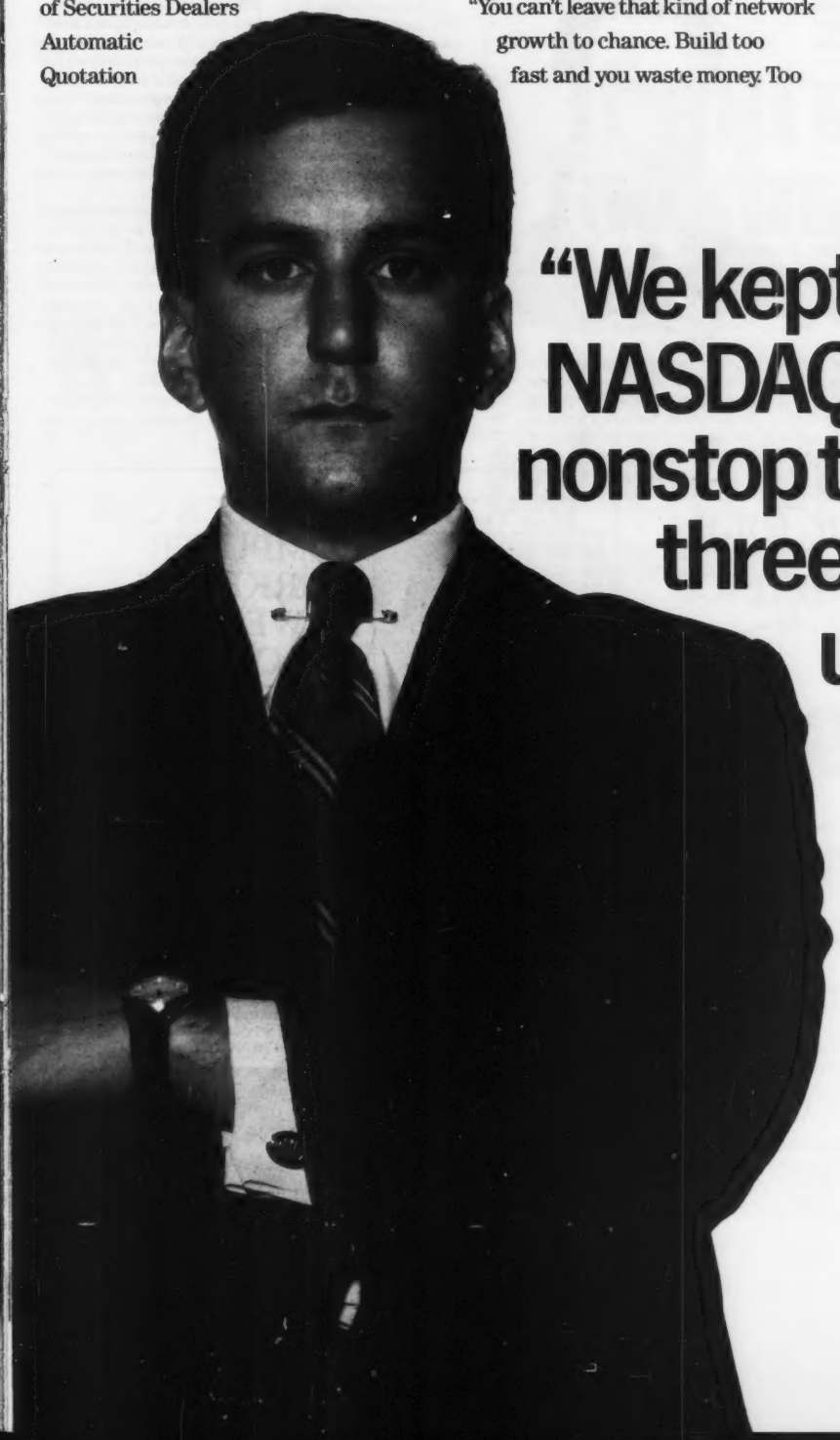
An electronic stock market. An international network of computers through which shares are electronically traded with incredible speed.

The market is NASDAQ, and the network was built with Unisys equipment. The National Association of Securities Dealers Automatic Quotation system was founded in 1971. By 1978, daily volume was 11 million shares.

Now, in 1987, an average of 155 million shares a day are traded on a network of 3,000 terminals over a 6 million square mile trading floor. Uptime for the central Unisys computer is 99.92%.

"You can't leave that kind of network growth to chance. Build too fast and you waste money. Too slowly and you compromise service," says Sam Vail. His Unisys team is responsible for helping NASDAQ plan and manage the network growth. "We've been through three generations of equipment without once stopping for software conversions," Sam proudly points out. "Unisys systems grow right alongside the customer. I guess that's what the power of 2 means."

Unisys and NASDAQ. The power of 2.



"We kept NASDAQ running nonstop through three major upgrades."

Sam Vail, Account Executive, Unisys.

UNISYS

The power of 2

DEC's DIS: Coping with growing demand

At Digital Equipment Corp., there is no mandate for the internal MIS department to use DEC equipment. In fact, according to Belford Cross, corporate manager of Digital Information Systems (DIS), the company was run on Burroughs Corp. equipment until 1970.

One would, nonetheless, be hard-pressed today to find non-DEC computers within the DIS environment.

"In the area of vendor selection, I have the easiest job in the world," Cross says. "It wouldn't surprise anyone that we're an all-DEC shop, but that didn't come about from mandates."

"One of the things that doesn't work in a decentralized management environment is dictates," Cross continues. "If a situation arises, say in the telecommunications area, where a DEC product runs out of functionality, we'll use other equipment."

Pressure to keep up

While vendor selection at the $8.5 billion Maynard, Mass., company is a nonissue, Cross does not have the world's easiest job. The company's phenomenal growth in the past two years — bucking the industry's downturn — has put tremendous pressure on the internal information systems function.

Structured along the same lines as the company's highly decentralized environment, DEC's MIS responsibilities are parceled out among the various business functions and geographies.

DEC's nearly 5,000 MIS professionals must scramble to keep up with user demand in the company's various locations. With a worldwide VAX network of 15,000 nodes, DEC possesses one of the largest integrated networks in the world, according to Cross.

That network, already under tremendous pressure, is expected to grow to 20,000 nodes by the end of this fiscal year and reach 40,000 within the following year.

"The toughest part is managing expectations," Cross says. "Being able to stay ahead of demand is really tough.

"We are adding 150 nodes per week to the network, and we are converting more and more of the way we run the business to take advantage of that distributed computing capability. The demand on the network is growing much more rapidly than the company itself," Cross continues.

Being on the leading edge is exciting, but it also has its downside. Cross says that because there is no larger DEC network in the world, his group tends to hit problems long before any of DEC's customers encounter them.

Belford Cross *of DEC*

"When we run into a wall, it is very complex because there is no one to consult with; we're breaking new ground," Cross explains. "We run so much of the business on the network itself that when we run into a problem, it can get very nasty."

DIS works closely with DEC's engineering and development groups as well as with field service. Often, the bulk of expertise about a particular application lies within DIS itself, and DEC's information systems professionals many times are called upon to provide insight for both internal development employees and external customers.

This expertise, plus the fact that DIS is DEC's largest customer, throws an added burden on Cross's group. Representatives from DIS sit on the product review boards to provide engineering and development input on the value of new products. "We're called upon to suggest which products should be in the research and development budget and what requirements should be met," Cross explains.

He adds that the development staff also turns to other large DEC customers for input. "If you asked me off to the side, I'd say [the development staff] listens much more to the customers outside than to the customer inside," Cross says. "But I believe that's appropriate."

Marketing training

DIS is also called on by the marketing department to be a showcase for DEC solutions. "We are theoretically less biased; we can talk information systems manager to information systems manager, programmer to programmer with our customers as they are solving problems because we face the same problems," Cross says.

DIS has created an executive contact program in which 30 senior information systems managers from various departments of the company were sent to the same two-week basic sales training course as new DEC sales representatives, as well as with a three-day seminar on essential presentation skills.

Those 30 senior information systems managers are consequently made available for

Investigate Your Total Network Performance

NetSpy™

Now there's an easy way to measure total network performance. **NetSpy,** the most complete VTAM network performance and response time monitor, is designed to help optimize your network in an MVS or MVS/XA environment.

NetSpy helps you:

- identify line utilization, error rates and traffic bottlenecks.
- set service level objectives based on response time and usage statistics.
- interface to **TPX** (Terminal Productivity Executive) and other multiple session management products.

For more information on **NetSpy** or to arrange a FREE 30-day trial, please call us today at (800) 323-2600.

DUQUESNE SYSTEMS
Two Allegheny Center
Pittsburgh, PA 15212

(412) 323-2600 in PA

REACH THE NUMBER ONE COMPUTER MARKET IN WESTERN EUROPE - W. GERMANY.

The West German data processing market was worth nearly $18.2 billion (U.S.) as of year-end 1985, and is expected to approach $38 billion by 1990.

CW Communications' West German publications cover all segments of this prospering marketplace.

Over 30,000 West German MIS/DP professionals rely on *Computerwoche* each week for up-to-date analysis and market information.

PC Welt is read by 25,000 West German, Austrian and Swiss IBM PC users and potential buyers each month.

98,000 Commodore owners and buyers read *Run* each month for reports on the Commodore marketplace.

Each week, 24,000 PC professionals read *PC Woche* (previously *InfoWelt)* for the information they need.

CW International Marketing Services makes advertising your products in West Germany, and around the world, easy. We have over 55 publications in 28 countries. **For advertising information, please call Frank Cutitta, Managing Director, International Marketing Services at 800-343-6474 (in MA 617-879-0700).**

CW COMMUNICATIONS INC.
International Marketing Services
West German Desk
375 Cochituate Road, Box 9171
Framingham, MA 01701-9171
617-879-0700/800-343-6474

an International Data Group company

marketing situations.

This program has been very successful, according to Cross. "Our customers are pretty clever, and they want to hear more than what sales and marketing have to say. They want to see people living and solving the problems in their situations," Cross says. This marketing ploy is so effective that demand for information systems professionals is high. DIS was forced to impose a 400-hours-per-quarter quota on its entire staff.

Cross insists this drain on his resources does not negatively affect the day-to-day running of DEC's information systems.

In fact, he points out, DIS gets as much back — in terms of learning from and sharing with leading customers — as it gives. "There are times when customers are teaching us because they are going to levels we haven't seen or figured out yet," he says.

DIS must also coordinate efforts with DEC's field service organization. Cross says he sometimes feels like the cobbler's child when it comes to service but that, in fact, DIS has a direct connection to the service organization. This is done so that the two groups can avoid duplicating skill sets and resources.

> "WHEN we run into a wall, it is very complex because there is no one to consult with; we're breaking new ground."
>
> BELFORD CROSS
> DEC

Cross is occasionally asked to provide an information systems professional to assist in a service call but says he avoids that additional burden as much as possible. "They'll generally go to development itself if they run out of rope, but occasionally they'll ask us to consult," Cross says.

Ironically, DIS has only recently confronted the added weight of a firm full of computer experts. Cross points out that until about three years ago, DEC was not unlike any other corporation when it came to computer literacy. "Computer literacy here was deplorable," he says.

With the proliferation of DEC's electronic mail network and computer training centers throughout the company, the status of computer literacy changed dramatically.

"When we put in electronic mail, it was initially hard to get it up and running," Cross claims. "Three years later, when the system broke down because it had grown too rapidly, it became business-threatening, and we had to solve the problem fast."

GLENN RIFKIN

Vendor MIS

CONTINUED FROM PAGE 62

payroll," Gordon says. "We even use it in the cafeteria. When people go through the line, they charge their meals, and [the cost] is deducted from their pay using an SAS application.

"When we look at software, we don't go outside the company. We can go outside, but I think all the people within the MIS department are SAS bigots," she says. "Occasionally, if we have a problem with performance we'll look at another alternative. But most of the time we end up trying to make our applications more efficient. We'll often end up working with the developers to make SAS faster rather than go outside."

There are times, however, when a company's own product line cannot be pushed to meet the need.

"It's a real emotional problem for a vendor to go and get another company's equipment," says Ken Bosomworth, president of International Resource Development, a Norwalk, Conn., market research firm. "They do all they can to avoid it. But some MIS managers do put their foot down and say, 'This system wasn't built for this application. I need another system.' " At Data General Corp. in Westboro, Mass., for instance, the internal information systems organization plans to look outside the company for a general-ledger package rather than make its own application, says Jagdish Dallal, the director of DG's

If you are looking at change control software, take a look at the experts.

Business Software Technology.

At Business Software Technology we are dedicated to one thing—developing and supporting the world's most advanced software for maintaining system integrity.

In just three years, Business Software Technology has established itself as the leader in system integrity and change control technology. We have provided change control solutions for the most critical applications of some of the world's largest companies.

Our development and support teams are comprised of recognized experts in IBM system software, large scale data center management, data base technology and application development.

What does this mean to you? Because of our total commitment to change control, we offer the most advanced technology available, faster enhancements, and a superb support and professional services network of change control experts.

So, if you are concerned about your company's system integrity, then contact the experts.

To find out more about Business Software Technology and its ENDEVOR line of change control products, you can write or call John Burton at (617) 870-1900.

BST Business Software Technology, Inc.

Westboro Executive Park, 114 Turnpike Road
Westborough, MA 01581 (617) 870-1900

The Change Control Experts.

Just because it's small doesn't mean you shouldn't take it seriously.

In fact, there is nothing funny about the Tandon Targa's high level of advanced features and performance. It has been designed to quietly fit into your working environment. Not dominate it.

With its trim, attractive design, it takes up 40% less space than comparable PCs.

But its small size belies its large number of features. Like full AT-compatibility. Five full-size expansion slots. 20MB of Winchester hard disk storage. A standard 1MB of memory on the main board. And Tandon's advanced memory management system that lets you use it all.

The Targa's small size is matched by its incredibly small price. At $1,999* it's a midget among the giants of the industry. And there is nothing funny about that, except that you can laugh all the way to the bank.

To see this small wonder in action, visit your nearest Tandon dealer or call us toll-free at **1-800-338-4555.** In California call **1-800-237-1735.**

Tandon CW 5/16

Price. Selection. Quality.

Please send me your Tandon Fact Pac, a comprehensive set of literature and product reviews:

Name

Position

Company

Address

Telephone

Tandon Computer Corporation
405 Science Drive Moorpark, CA 93021 805/378.6104

*Monitor not included.

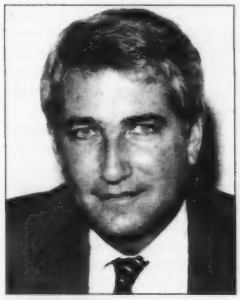
information center, technology and control division.

Out of necessity, some vendors are forced to rely on outside companies. Either their product line is limited or they do not have time to wait for their applications to be developed.

Meeting needs

Apollo Computer Inc., based in Chelmsford, Mass., is such a company. "When we first started, there was a move afoot to do things like DEC," says Bob Elliott, vice-president of information systems and resources. "We said we would try to do everything on our own systems. We'll force it, and even if it doesn't do it, eventually we'll get it right."

But the policy did not meet their immediate needs, Elliott says. "We didn't have the luxury to wait for 'eventually,' and so we said, 'If somebody else builds the gear that does the business data processing, OK. Let's not be proud, let's use it,' " he explains.



"WE said, 'If somebody else builds the gear that does the business data processing, OK. Let's not be proud, let's use it.' "

BOB ELLIOTT
APOLLO COMPUTER, INC.

Between 1983 and 1985, Apollo's information systems organization had to move quickly to keep up with a company that was doubling in size each year. The result is a multivendor environment for business applications, anchored by Hewlett-Packard Co. 3000 and Wang VS 100 minicomputers and an IBM 4381 mainframe. Connecting the systems is a nationwide IBM Systems Network Architecture network. A parallel 2,000-node Apollo Domain network is used for engineering, research and development and electronic mail and acts as an interface with some of the business systems.

"When we couldn't build enough nodes to satisfy our own needs, we were buying personal computers from Wang and IBM and so on," Elliott says. "We made a standard subset of them because we knew we were going into the IBM world, and we were already in the HP world."

To take advantage of Apollo's own workstations, Elliott's group developed interfaces that allow users to access data residing anywhere on the two networks via a series of windows.

Now that the infrastructure is in place, Elliott says Apollo's information systems department is focusing on acting as a beta site for new products.

Apollo's equipment policies are similar to those practiced by many software companies for hardware selection. But when software packages are considered, vendors such as Lotus Development Corp. emphasize the use of their own products.

"No one would get shot in the parking lot for using someone else's package, but in general we find that our users can meet their needs with our packages," says Jack Fuehr, Lotus's vice-president of MIS.

In the early 1970s many vendors used outside equipment, Rossi says. But the trend to providing customers total solutions caused vendors to fill gaps in their product lines and adopt unwritten policies that exclude other sources.

"Back then, IBM used a lot of Wang equipment," Rossi says. "It was really because the vendors did not have comparable equipment in their own product lines. If they didn't have the equipment they really needed, they would go out and buy it from another vendor."

There are still gaps in product

Continued on page 69

SCIENCE/SCOPE®

Multilayer ceramic wiring boards can be built at lower cost with a new process for applying dielectric layers during fabrication. The new technique, developed by Hughes Aircraft Company, is called TTRAN™ and is both faster and more reliable than conventional thick-film technology. Instead of screen-printing the dielectric, the process presses and heat-seals it from a tape to any size substrate. This makes fabrication easier and reduces both labor and processing time. Applications include computers, missiles, and radar systems, where high reliability and resistance to harsh environments are vital.

The first man-portable automatic test system will improve weapons readiness, reduce turnaround time, and ensure mission success during rapid deployment of military aircraft. The Generic Test System (GENTS) is a highly mobile automatic test system used to support avionics maintenance. GENTS contains a micro computer, control and support software, and instrument-on-a-card technology. It is compliant with the USAF Moduler Automatic Test Equipment (MATE) standards. A team formed by Hughes, AAI Corporation, Rockwell International, and Test Technology, Inc. is adapting GENTS for the National Guard A-7 Corsair.

TOW Airborne Sight systems installed on a variety of attack helicopters can be tested and returned to service quickly with the aid of the new Automatic Optical Bench (AOB). The AOB, developed by Hughes, can be used to test and diagnose the TOW (Tube-launched, Optically tracked, Wire-guided) missile telescopic sight unit, including the built-in Laser Range Finder. The computer-controlled AOB is supplemented by a complete set of tools and fixtures to disassemble, repair, and reassemble a TOW Airborne Sight unit. Testing that conventionally would require eight hours can be completed in two hours with the AOB and a semiskilled technician. AOBs are currently operational at U.S. Army facilities and locations overseas.

The Hughes Consolidated Repair Facility will save the U.S. Army Missile Command $1 million per year. The new 26,000 sq. ft. building in Las Cruces, New Mexico will be the central repair and logistic support center for sophisticated Roland radar and electro-optical units made by Hughes. The Roland system is a short-range, all-weather system that uses supersonic missiles to defend against low-altitude threats. It is currently deployed with full-time troops of the New Mexico Army National Guard at McGregor Range, New Mexico.

Hughes is seeking experienced engineers and scientists to further develop advanced spacecraft systems and components for communications satellites. Openings are in the fields of: software, computers, and data processing systems; electrical components; microwave/RF communication systems development; on-board spacecraft electronics and control systems; satellite design, integration, propulsion, and electrical power system development; spacecraft manufacturing, systems test and evaluation; GaAs applications R&D. Send your resume to Dan Frownfelter, Hughes Space & Communications Group, Dept. S3, S4/A300, P.O. Box 92919, Los Angeles, CA 90009. EOE. U.S. citizenship required.

For more information write to: P.O. Box 45066, Los Angeles, CA 90045-0066

© 1987 Hughes Aircraft Company

HUGHES

Subsidiary of GM Hughes Electronics

Cullinet switches MIS to a corporate function

Until just a year ago, the MIS function at Cullinet Software, Inc. was part of the company's development group. When the Westwood, Mass., software supplier went through an internal restructuring upheaval during that period, the new Executive Vice-President Jim Pitts moved to switch MIS from a development function to a corporate one.

"MIS had become viewed as a sort of private arm of the development group simply because development was the biggest user and was seen as the seat of the expertise," Pitts recalls.

"But in that organizational structure, MIS was clearly not getting its fair shake of the corporate resources. It had to share development's resources. There were also a great deal of disgruntled users in the nondevelopment community at Cullinet," he says.

Pitts, upon joining Cullinet after leaving Data General Corp., immediately moved MIS into a corporate role. The company was going through a major transition of top executives, and the restructuring of MIS provided better rationalization of resources and made it a more realistic resource for all of the firm's users.

No MIS strategy

"In the past, there was no written or articulated MIS strategy," Pitts says. "It was my view that MIS at Cullinet ought to be a showcase for our products."

Donald R. Taylor, Cullinet's director of information systems, declares, "There's no doubt that many more people here now realize the significance of good information systems than a year ago. They see that the running of the company depends on good systems."

Taylor, who moved to information systems from the finance and accounting side of Cullinet last August, says the MIS department is now included as part of the corporate data center, which includes operations, user support and the company's information center.

Unlike companies with enormous corporate MIS departments such as IBM or Digital Equipment Corp., Cullinet's MIS function employs just 30 professionals to run the company's three IBM mainframes — a 3090 Model 400, a 3084 and a 4381 — a spate of DEC VAXs at remote operations scattered throughout the country and more than 900 IBM Personal Computers.

In the past, Taylor says, the primary users group for information systems at Cullinet was the technical support people. But, more and more, information systems now takes on support of the financial, personnel and administrative functions of the firm. In fact, Taylor was brought in specifically to furnish MIS with the end-user perspective.

Demanding users

"Because the people at Cullinet tended to be very technical, there wasn't a strong need for an MIS department," Taylor explains. While that is changing, it brings with it a stiff challenge for MIS. "Our users are very technical and very demanding," Taylor states.

"They think they know more than we do, and it is very difficult to manage expectations. Unfortunately, you have technicians who think they could solve their own particular problem in an hour doing it themselves, but that destroys the overall work that we are doing," he observes.

Taylor's mandate is to create a more proactive MIS function, to find problems and offer solutions before the users realize the need for them.

To do that, the MIS group has started hiring more nontechnical staff from within Cullinet. Taylor says he believes these people can get the requisite technical training on the job.

According to Pitts, Cullinet, a $200 million corporation, spends between $10 million and $12 million on MIS. The money is well spent, he says, because MIS is not only a tool for classic business functions, but it is also the tool for the software factory, which is the company's business.

Unlike a hardware vendor, Cullinet does not face restrictions on its computer purchases. Nonetheless, except for the research and development arena, Cullinet is heavily an IBM shop. For its mainframe systems and application software, Taylor is not required to use Cullinet products but he chooses to do so anyway.

"We simply don't want our competitors' problems in-house," he says. "How do you support it? We get free documentation and support, and that just would not be viable with a product from a close competitor."

In addition, the internal MIS group often serves as a beta-test site for new products if they are applicable to part of Cullinet's business. On the application software side, eligibility for being a beta-test site depends upon having a similar business need to the one the product serves.

The MIS group is centralized in the sense that all of the company's mainframes reside in Cullinet's Westwood

The Magic.

The Facts.

The fact is, companies that use PostScript® laser printers are creating some very exciting communications. Quite often, the word magic pops up.

Yet behind this exciting development in business communication, you'll find some hard facts worth serious consideration.

Fact. PostScript is the page description language chosen by some of the best names in desktop publishing.

Fact. PostScript gives you the option of printing from an IBM PC, Macintosh, or mini/mainframe.

Fact. You won't be tied to a single vendor so you can buy the printer that's best for your company's needs.

Fact. Since PostScript is device independent, you can design a document, then professionally print it later at a higher resolution.

Fact. You can choose from hundreds of software programs that support PostScript.

Fact. PostScript lets you combine text, line art, and even digitized photographs on the same page.

Fact. If you don't ask for a printer equipped with PostScript, you won't get the magic behind desktop publishing.

Now that you have the facts, just think what your company can do with the magic. For more facts, give us a call at 415-852-0271.

ADOBE SYSTEMS INCORPORATED

PostScript from Adobe.
The magic behind desktop publishing.

The pages above were printed on a PostScript equipped printer.

*PostScript printers include Agfa-Gevaert P400PS, Apollo Domain/Laser 26, Apple LaserWriter/LaserWriter Plus, Dataproducts LZR-2665, Diconix Dijit 1/PS, Digital Equipment Corp. PrintServer 40/Script Printer, ITT Qume ScriptTEN, Laser Connection PS Jet, Linotype Linotronic 100/Linotronic 300, NEI Model 908, NEC SilentWriter LC-890, QMS-PS 800/800 Plus, QMS-PS 2400, QMS-PS 2700 CK, Sun Microsystems LaserWriter, Texas Instruments OmniLaser 2108/OmniLaser 2115.

PostScript is a registered trademark of Adobe Systems Incorporated. Other brand names are trademarks or registered trademarks of their respective holders.

facilities. MIS provides users with access 24 hours a day, seven days a week to remote sites as far removed as Australia and Norway.

Taylor continually hears more requests for DEC VAXs at both local and remote sites. "People want to try what's new," he says.

Departmental competition

One of the major obstacles Taylor faces in working from within a vendor company is that his group is dependent on the development's schedule for the release of the company's application products.

"We don't compete with development for our own applications," Taylor says. "We don't want to be reinventing the wheel, and our objective is to use only what we sell outside."

Unlike its larger counterparts, Cullinet's MIS group does no product development. The company does, however, sell the application software developed for such in-house applications as sales and marketing. And although it is not generally called upon to showcase Cullinet's products, Taylor's information systems department is more than amenable to expanding into that marketing arena.

"WE don't compete with development for our own applications," he says. "We don't want to be reinventing the wheel, and our objective is to use only what we sell outside."

DONALD TAYLOR
CULLINET SOFTWARE, INC.

He also acknowledges that when it comes to service and support, the customer comes first. He insists, however, that there is a solid working relationship with the service organization. "We almost always find ways to work together," he says.

On the leading edge

Ultimately, Taylor says he finds that being an MIS director within a vendor organization provides the most stimulating challenge.

"We're always at the forefront of technology here, and people like that. We want to be a showcase customer for Cullinet; we should be doing first what we suggest to our customers," Taylor says.

Pitts points out that the transition for MIS is far from complete.

"We haven't gotten to where we want to be just yet. This is a multiyear project," he says. "And it's a moving target."

GLENN RIFKIN

Vendor MIS

CONTINUED FROM PAGE 67

lines today, but they are often in less significant areas. Most of the well-known hardware vendors build their own processors or programs to run the bread-and-butter business and end-user applications. But many vendors are working to fill gaps with new technologies.

For example, prior to the present surge in electronic publishing systems, most vendors relied on outside sources to meet their internal publishing needs. Today, the vendors are building publishing departments to utilize their own software and hardware, according to Rossi.

MIS managers outside vendor organizations benefit from the vendors' internal use of their own equipment in two ways:

- Vendor MIS operations must implement their companies' equipment in nontraditional ways to meet all their needs.
- The push to develop systems in-house to fill product gaps often leads directly to producing marketable products to meet customer needs. Without internal user concerns, vendors may not address the gaps at all.

The MIS function at McCormack & Dodge Corp., a Natick, Mass.-based software vendor, also plays an important role in product development. For example, the MIS department developed the Millenium System Development Tool (M:SDT).

"We built SDT internally because we found we couldn't get products to market quick enough, and we needed faster development," says Dean Redfern, vice-president of M&D's Application Tools Business Unit.

In addition to supporting internal business needs, Redfern's group is also charged with assisting the company's development division with product strategy. "Who is better positioned to understand what a Sierra-level announcement means than the guys that are technically working with one?" Redfern asks.

While software companies look to MIS for applications enhancements, companies that make complete systems emphasize homegrown networks composed of their own processors.

In fact, Prime claims the networked Prime 9950s and 850s are allowing the

Case History #60341

"Arco Petroleum Products comes to mind," said Bill Kilpatrick, of The Software Works! of Glendale, California. "It was a big project. Arco had already been through two expensive failures with other companies who could not deliver the custom software they needed. It was a Point of Sale system, a cash register interface and custom-accounting software for their entire franchised chain of convenience stores, gas stations and auto tune-up centers. It had to be done fast and it had to work. Our competition proposed a dBASE III+ solution. We proposed DataFlex. I said, 'I'll make a challenge, if we can't deliver the completed project faster using DataFlex, following the exact specifications that have already been laid out, then Arco doesn't have to pay us a dime.' We knew we could do the job right and we knew we could do it faster with DataFlex."

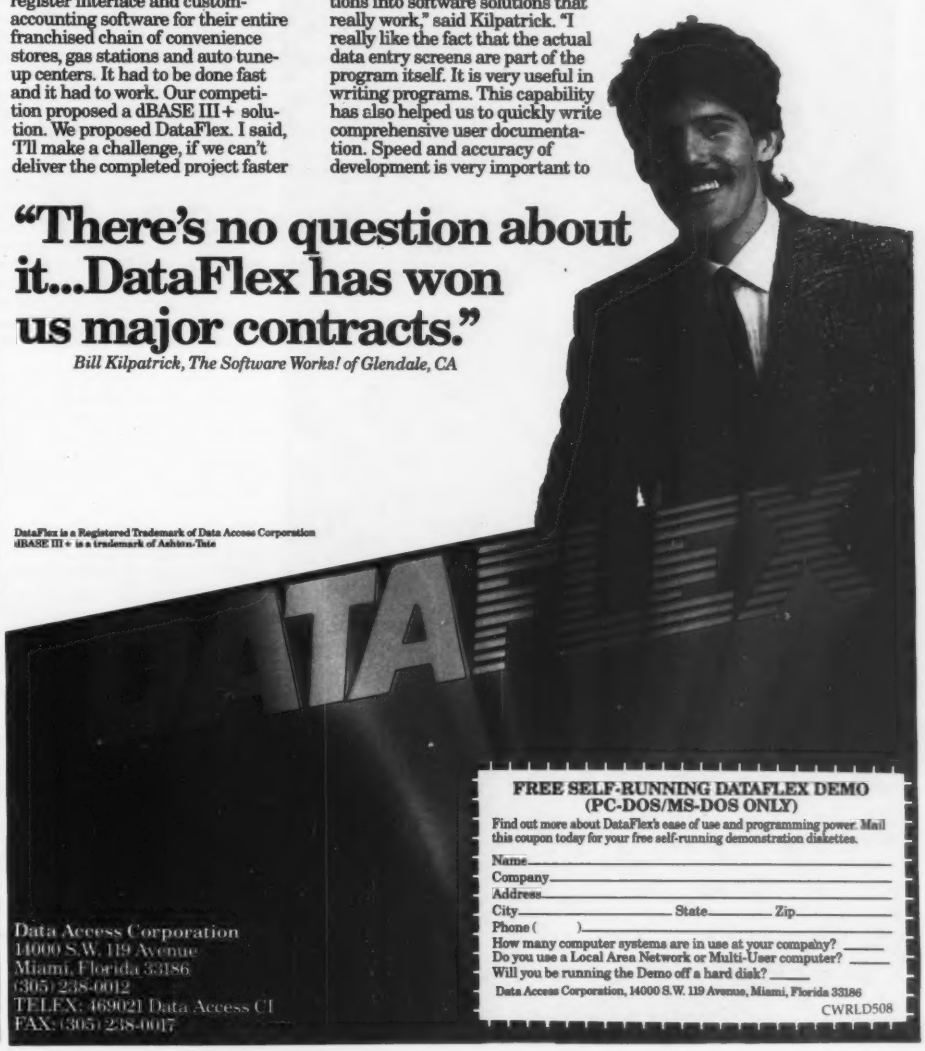
A Powerful 4GL Speeds Development

"DataFlex is an ideal language for rapidly-turning system specifications into software solutions that really work," said Kilpatrick. "I really like the fact that the actual data entry screens are part of the program itself. It is very useful in writing programs. This capability has also helped us to quickly write comprehensive user documentation. Speed and accuracy of development is very important to us. Features like the macros, the program generator and report generator enable us to do more, using less code, in a lot less time."

Take the first step to more efficient program development today. Return the coupon below for your free DataFlex Demonstration Diskettes.

"There's no question about it...DataFlex has won us major contracts."

Bill Kilpatrick, The Software Works! of Glendale, CA



DataFlex is a Registered Trademark of Data Access Corporation
dBASE III + is a trademark of Ashton-Tate

Data Access Corporation
14000 S.W. 119 Avenue
Miami, Florida 33186
(305) 238-0012
TELEX: 469021 Data Access CI
FAX: (305) 238-0017

FREE SELF-RUNNING DATAFLEX DEMO (PC-DOS/MS-DOS ONLY)

Find out more about DataFlex's ease of use and programming power. Mail this coupon today for your free self-running demonstration diskettes.

Name_____
Company_____
Address_____
City_____ State_____ Zip_____
Phone ( ) _____
How many computer systems are in use at your company? _____
Do you use a Local Area Network or Multi-User computer? _____
Will you be running the Demo off a hard disk? _____

Data Access Corporation, 14000 S.W. 119 Avenue, Miami, Florida 33186

CWRLD508

nearly $1 billion company to run all its producton applications without a mainframe.

"I used to work in a company where we were attempting to tie equipment from multiple vendors together, and there were a lot of issues around that," Prime's Stella says. "Today in our environment there is connectability and compatibility. I no longer have the problems I had in those days."

Prime operates four data centers in the U.S., containing more than 60 systems total. In the company's data centers at the Natick headquarters, in Milford, Mass., and in Framingham, Mass., the manufacturing facilities are tied together by Primenet, a backbone data communications network.

Ringnet, another Prime product, is used as a local-area network, while a Telenet packet communications network is used to link local and long-distance networks.

"We started with the strategy that we would use our own equipment when we were a small company," Stella says. "We prefer to stay this way, but we continually ask the question, When do we run out of gas?"

At the heart of Prime's network is what Stella calls a "virtual mainframe" composed of multiple superminicomputers. Each minicomputer is dedicated to a specific application and connected to its neighbors on a local-area network.

Other minicomputer makers, like Hewlett-Packard Co. and Data General Corp., emphasize the use of their own processors and software, but they also acknowledge that IBM mainframes are a necessity to perform certain business functions.

The move to minis

Once reliant on mainframes for most of its processing, HP has gradually moved almost all of its applications to its own minicomputers in distributed locations worldwide, according to Lloyd Taylor, HP's director of corporate information systems. However, the corporate financial applications remain on an IBM mainframe in a Palo Alto, Calif., site.

"We don't sell HP minicomputers on the basis that they're the only solutions in the information systems world. There are, in fact, many instances where minicomputers do need to be and are in coexistent environments with mainframes, and we don't operate our own company in a manner much different than that," Taylor says.

DG's Jagdish Dallal

DG has also changed the focus of its MIS organizations to accommodate product-oriented strategies. Until last August, each of DG's data centers was operated by local MIS management reporting to the division it supported. To more closely resemble customer sites, the company has developed a corporate-level internal MIS function that now runs the data centers, Dallal says.

"One of the driving forces behind the change was to develop a formal way to test DG products," Dallal says. "We also wanted to leverage sales by saying to our customers, 'Here is how the equipment is utilized in a large manufacturing corporation such as DG.' "

While the company relies heavily on its own MV/20000 and 10000 processors on a 300-node network, an IBM 4341 is also used for a single human-resources application.

A wide range of non-DG software is made available in information resource centers throughout the corporation. Employees can access information from DG processors or work in the centers with packages from other vendors', which are designed to reduce the MIS report-writing workload. •

Campbell Soup, Smith Barney, The Commonwealth of Virginia and USAir have all benefited from Peat Marwick's unequalled information systems development experience.

Maybe you can, too.

In an area where experience really counts, you can count on Peat Marwick. Our experienced systems consultants bring you the highest level of expertise, whether your project involves systems planning, custom design and development, packaged software implementation or software re-engineering services.

Peat Marwick's systems consultants average more than ten years' experience. What this means to you is an unequalled opportunity to get more out of the system you are planning, developing, implementing or maintaining. Our consultants provide high quality, and reliable consulting services that will help take the risk out of your critical systems projects. And they will follow through to insure that your systems continue to perform at peak effectiveness.

You can benefit from the information systems skills that have helped some of the world's finest corporations and governments. For more information and a free copy of our systems brochure, "Meeting the Technology Challenge," send in the coupon below or call **1-800-344-3600.** (In Illinois, call 800-328-4200.)

Mail to: Peat Marwick Main & Co.
345 Park Avenue, Box ISS, New York, NY 10154

Name
Title
Company
Address
City
State Zip

KPMG Peat Marwick
Accounting and Auditing/
Tax Services/Management Consulting/
Information Systems Services

INTERVIEW

It hurt, but IDS built an architecture that won't change

A conversation with Alan Bignall

Alan Bignall is vice-president of corporate information systems for IDS Financial Services, Inc., headquartered in Minneapolis. IDS has an enviable position competitively as a full-service, personal financial planning company whose services include life insurance, mutual funds, brokerage and lending. Bignall weathered the company's acquisition by American Express Co. in 1984 whereby IDS gained the funding to begin some aggressively innovative technology projects.

Bignall's background as a programmer at Montreal's Royal Bank of Canada left him with a marked Canadian accent and a slight distaste for programming. He was hired by IDS's Advanced Systems Group, and he moved first to director of systems development and then to his current position as vice-president of corporate systems in just eight years.

Bignall spoke with *Computerworld* Associate Editor Amy Fiore recently at a conference entitled, "The Inevitable Partnership," sponsored by the Life Office Management Association in Atlanta. At the close of the interview, which took place in a restaurant, Fiore paid the check with a standard-issue Visa card. Bignall seized the opportunity to scold, "Why don't you get yourself an American Express card?" He smiled and muttered, "Market, market, market."

COURTESY OF THE LIFE OFFICE MANAGEMENT ASSOCIATION

"IDS has only one mission, and that is financial planning. Senior management in particular is sold on that idea."

.....

"I think — I even hope — that the future data processing manager will be less of a technician and more of a businessman than even I was, and I've tried deliberately not to be a technician.

.....

"An architecture and an infrastructure — maintaining the integrity of that, keeping it true to the mission — I think is the most important thing."

.....

How does IDS promote the partnership between MIS, end users and top management?

IDS is all in one location, in downtown Minneapolis. That enables us very easily to work with the clients — which is what we call them, as opposed to "users."

Also, we have a project orientation within the company. When we want to do something, we set up a team to do it, as opposed to having it be part of an existing organization. That team includes user representatives and MIS representatives and a project manager or leader.

You're describing a partnership between users, or "clients," and MIS. But what about between top management and MIS?

The same relationship occurs. Top management is involved in reviewing our requirements.

Maybe the most important thing to say is that IDS has only one mission statement, and that is financial planning.

So although we have a life insurance company and a mutual fund operation and a certificate operation and a brokerage and various other areas, they're all there because we're financial planners.

Senior management in particular is sold on that idea, so they get involved in everything that helps us move toward that financial planning mission.

And how does the information systems group buy into that corporate mission?

The watershed event was when American Express purchased IDS back in January '84. At that time, we got a new chief executive officer, Harvey Golub. He focused us on this mission: Instead of trying to be the best

CompuServe is Investing in 4GL/DBMS Software for Your Future

CompuServe has bought the DBMS business of Software House. That's a major investment in the 4GL/DBMS software you need for your company's applications.

We're expanding staff and adding facilities to make these products stronger and more useful. Here's what we mean:

- **System 1022** is already the premier DBMS for DECsystem-10/20s. Right now we've got total PC data integration, allowing you to move data back and forth between your mainframe and commonly used PC software.

  Soon you'll see PCs as workstations, integration with VAX, and facilities to extend the lifespan of your TOPS-10/20 applications.

- **System 1032** is one of the most powerful 4GLs for applications development on the VAX. We're now demonstrating screen-based applications generation to give you quicker access to that power. We have PCs downloading data from the VAX to put information in the hands of the information workers.

  More screen-based facilities are in development now. Plus natural language capability and PC workstation software.

Call us about your company's needs, and find out how CompuServe's investment will help your applications.

CompuServe

Data Technologies

formerly Software House
1000 Massachusetts Avenue
Cambridge, MA 02138
Tel (617) 661-9440

insurance company, we want to be the best financial planning company. And that might mean that we're not the most cost-effective insurance company, because there's an overhead in operating a financial planning environment that isn't there in a straight life-insurance operation.

MIS has always been oriented toward the client. We've always had the vision of client systems. It wasn't until the American Express acquisition that we got the senior management backing to create client service systems as opposed to product service systems.

Has there been resistance in any pocket of the organization?

Yes, in all pockets. I don't see how you can create that much of a change without getting some resistance. It's a different way of dealing with the customer than when you're just trying to satisfy that one life insurance need. All the infrastructure of the company — which is really the systems and procedures that run the company — they're all going to change as you move toward the vision. So everybody felt it.

What is IDS's hardware environment?

We're an IBM shop, a typical large shop. We have two 3090 Model 400s that run our major processing operation. We're continually looking at our hardware, so it changes from time to time, but whatever the latest IBM product is, typically we'll be somewhere near the first customers to have it.

Do you have two 3090s for redundancy or just for extra processing power?

Extra processing, although obviously there's some thought about redundancy in there. But we do have a backup plan in place. Typically, one 3090 runs the production systems during the day, and the other one is a development machine and the information center machine.

So you have a separate development machine?

Yes. It's a tremendous resource to leverage. Remember, there are 400 development people — the programmer/analysts — so that's quite a bit to leverage. About 60% of these people are in new development, which is an unusual mix compared with our typical competitors, who are running more like 30% committed to new development.

Do you have a single, unified corporate data base?

Let's say we have a single corporate architecture. I think how you choose to implement that data architecture — which technology you use to implement it — is based on the technical, business and economical considerations at the time.

We're a CICS/DLI shop, but we have a lot of straight VSAM files out there. We chose CICS deliberately so we could share those file structures in our online environments, because CICS allows you to access multiple types of file structures.

We care much more about the architecture than we do about the physical environment because we figure that will change over time.

So you have a variety of DBMS running under CICS?

Yes. The main one is DL/1. VSAM runs the typical flat files that we have. Then we have some old systems running under CICS/OS, from decades ago, assembler-type files. We have IBM's DB2 in there, too.

All of those are linked together in an architecture sense. The data administration group controls the data architecture in the corporation. We won't allow a project to start until the data administrators have created the data model of that piece of the operation, which they then merge into the corporate data architecture.

How big is that group?

About 14 people. And we don't consider it an overhead group, which is what a lot of corporations consider it.

Did they create a single, enterprisewide data model and start from the top down?

No. That's a theoretician's view.

We started with the key business, which is financial planning, and we said, "Client must be key," right? If you're going to have this financial plan, you've got to have a client perspective. And in our case, it's a household perspective also, because you don't plan on your own. You plan with your husband or wife.

So the first data model we built was the client, and we felt that was the core. It turned out to be a good guess. From that, the next model was the marketing model, and those two fit very nicely together.

We've been doing the various products one by one since that time. But very little effort is needed because we find a lot of it is in that basic structure we already built for our client.

How long will the whole process take?

The architecture is going to be implemented over five to nine years. We've been working on it for just a little more than three years now and have implemented the core infrastructure. As long as the vision doesn't change, we guarantee that the architecture won't need to change.

You just add to it?

Right. At the high level, we have a corporate architecture now. We've gone from the middle out. We went upward and downward at the same time. A lot of people are starting to profess that's the best way to do it.

I have a lot of trouble understanding how I could get enough time and energy from the right people to do a corporate one first.

What applications development tools does IDS use?

We've chosen to develop all our new systems under a product from CGI Systems, Inc. called Pacbase. It gives us a standard approach. And what we're finding is the movement of staff is easy because of Pacbase. Every program it generates looks the same. Every paragraph does the same thing in every program.

The tools with which you need to do the maintenance are all there in a central dictionary. So we don't have the problem we used to have where you had to know the system so well to be able to maintain it.

Do you optimize the code Pacbase generates?

Yes, we do.

But doesn't that make the programs look dissimilar?

It doesn't affect maintenance at all. If there's a problem with a Pacbase program, you don't look at the code. You go back to the Pacbase dictionary and look

At a glance

IDS Financial Services, Inc.

Home office employees	2,800
Home office workstations	2,650
Financial planners	6,000 nationwide
Founded	1894
1986 revenue	$2.4 billion

INFORMATION PROVIDED BY IDS FINANCIAL SERVICES, INC.
CW CHART

9-TRACK TAPE OCR SCANNING WP CONVERSIONS FOR YOUR PC

For thousands of customers, we supplied a low cost connection to get information into their PC.

Our **"TAPE CONNECTION"** system can read and write 1/2" 9-Track 800/1600/6250 mainframe tapes.

Our **"SCANNING CONNECTION"** system can recognize text and scan pictures for desktop publishing.

Our **"DISKETTE CONNECTION"** system can read and write files on your 3½"/5¼"/8" diskettes.

We manufacture many hardware products and have developed hundreds of programs. For product information call **602-779-3341.**

Flagstaff Engineering
1120 Kaibab • Flagstaff, AZ 86001

SYSTEMS ANALYSTS . . . APPLICATION DESIGNERS AND PROGRAMMERS . . .

Don't Miss Out on Mastering DB2
—The Most Important DP Technology Ever!

Learn all you need to know about IBM's extraordinary DB2, the relational database system that's revolutionizing the way IBM installations process data.

The DB2 Handbook is the first book—the only book—that explains all you need to know about DB2 and its language, SQL. Here, in one comprehensive volume, you'll find all the information required for building a strong DB2 foundation. Topics include:

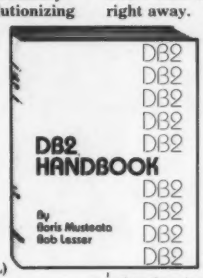
- **Introduction to DB2**
- **The DB2 Processing Environment**
- **DB2 Facilities**
- **DB2 Application Development**
- **Essentials of Structural Query Language (SQL)**
- **DB2 System Performance Considerations**
- **Recommendations and Tips on DB2 Usage**

In short, you'll gain a quick and total grasp of the single most exciting DBMS breakthrough of the eighties!

The least expensive career investment you can make!

If you're involved in any way with IBM mainframe installations, you must quickly develop a working knowledge of DB2, the wave of the future in data processing. That's why ordering The DB2 Handbook can be the cornerstone of your career advancement.

Don't wait! Call now. Or fill out and mail the coupon right away.



The DB2 Handbook
by Boris Musteata and Bob Lesser
Authors of VSAM Techniques and CICS Programming
Only $19.95
Unique Money-Back Guarantee
This book will earn its purchase price over and over again—or get a 100% refund whenever you request it!
Act Now! Quantities are limited.
Call 1-800-628/2828 Ext. 683
MasterCharge, VISA or C.O.D.
(N.Y. residents: please add 5⅛% N.Y.S. sales tax)
Allow 4 to 6 weeks for delivery

Yes! My career advancement is worth much more than the price of this invaluable book. Send me _____ copies of The DB2 Handbook @ $19.95 + $2.00 shipping and handling, for a total of $_____. Money-back guarantee AT ANY TIME if not completely satisfied.

Method of Payment: _Check _VISA _MasterCard _C.O.D.
Card # _____ Exp. Date _____
Name (please print) _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Telephone (_____) _____

Mail to: TLM, Inc. 420 Westchester Ave., Port Chester, NY 10573

at the assumptions that generated the code, because that's where your error is. You start correcting the error there.

Once you have corrected the error, then do you regenerate the code and reoptimize it?
Right. It's been a major plus in our organization for productivity and reliability.

Have you been able to quantify the benefits?
Don't want to and don't need to. We brought it in without any real justification because it seemed to do all the things we wanted it to do at the time we were starting the new architecture. And everybody's opinion is that it has, so why should I waste my time proving it?

Have there been any trade-offs to using it?
There are always trade-offs. People who think writing Cobol code is the only way to go probably felt emasculated when we took that away. But now, Pacbase programmers command a good $5,000 to $10,000 premium over non-Pacbase programmers in the market.

I can't think of anything that hit us negatively. There is a perception that the Pacbase code is less efficient, but I've had my technical people look at that, and they claim it's more efficient than your average programmer would write anyway.

The other thing is that Pacbase still doesn't help you design good data base structures and file structures. If you design those wrong up front, then everything can certainly look less efficient than it should be.

Do you have automated tools for that front-end work?
No, not as automated as I would like. IBM supplies some basic tools for modeling the DL/1 data bases, which are just the ones that will grind everything to a halt pretty fast.

What other computer-aided software engineering tools do you rely that heavily on?
We have a CICS test package called Intertest [from On-Line Software International, Inc.], which we rely very heavily on, and IBM's Batch Terminal Simulator for testing the batch DL/1-type programs. We use [Compuware Corp.'s] Abend-Aid. And we rely heavily on a product called Excelerator [from Index Technology Corp.] for our data architecture control.

Pacbase does just about everything else. It generates all the technical support-type things I need out of the one central dictionary.

What kind of networks does IDS use?
In the home office, there's roughly a 1-to-1 terminal ratio. Some of them are personal computers, some of them are dumb terminals. They're all locally attached because we're all in the same city-center area.

In the field, we're reaching the last stages of rolling out a nationwide IBM Systems Network Architecture network to all of our divisional offices. They're all on-line to that leased-line network.

Profs [IBM's Professional Office System] is installed pretty well throughout the company, too, in the home office. We've been on electronic mail for a couple of years now.

> PROFS caught on because all of MIS went on it — all 800 or 900 people — and the only way you can talk to us efficiently is to get on Profs.

Do people use it?
It's wonderful. Senior management uses it.

Is that why it caught on?
No. It caught on because all of MIS went on it — all 800 or 900 people — and the only way you can talk to us efficiently is to get on Profs.

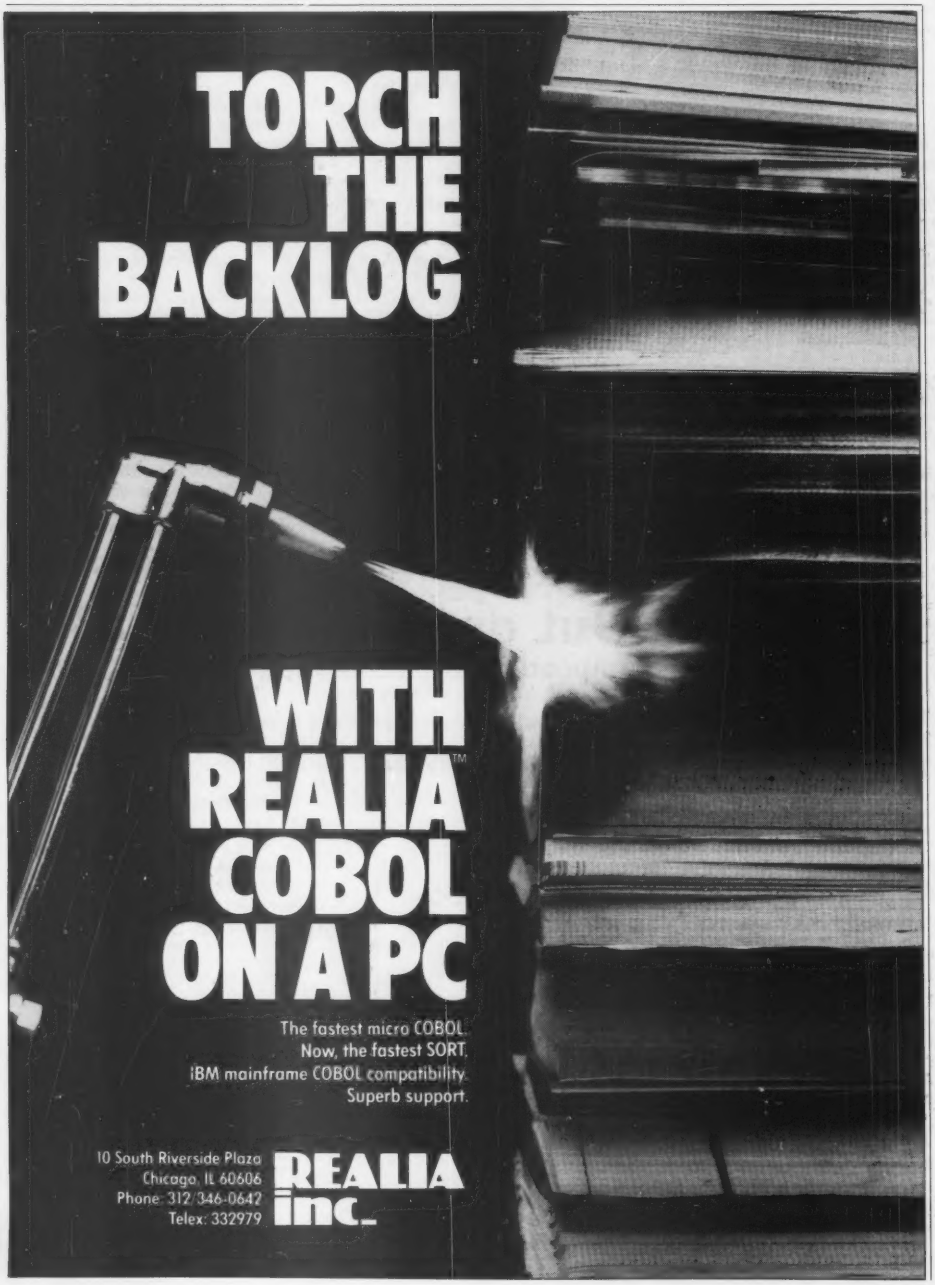
In addition to that, we have a reasonably official policy of trying to move people out from the information systems department into the user/client areas. We like the idea of our people moving out there to begin to spread the word.

Are any of your buildings new? Have you had to make the cabling decision lately?
No, we're in the process of designing and selecting a site for a brand-new building now. Obviously, one of the things we'll do is cable that in the best way possible.

When will you complete the new building?
In the next two or three months we'll be announcing the site and the design, and then it typically takes about three years to build a building. And there's a new data center along with all of that, too.

How do you plan three years out in terms of what's technically available?
You can never predict what's going to be there. All you can do is predict your usage and then, based on economics, you choose what looks like the best cable. But we'll make the decision as late as possible. The builders will say, "You've got to make it now," and that's when we'll make it.

Will IDS buy IBM's Personal System/2?
Again, I think you have to let economics



and business need drive it, not just technology. So IBM announces something new; so big deal. If it's not going to do anything for me right now, then I'm not going to rush out and buy it.

What if IBM announces something new, and it is not available for a long time, such as LU6.2? What is your feeling about this type of announcement?
I care more about architecting where we're going than physically implementing it. LU6.2 is an architecture, and — as long as when I go out and talk to other vendors of equipment they say they're going to meet the LU6.2 standards — then I think we're fairly comfortable.

So those announcements are important to you, even though there is no way to implement them at the time?
The architecturally based ones are important. The fact that they've announced a new line of PCs is really not that important. It's exciting from a technician's point of view, but from a business point of view, it's only exciting when we have a need for those facilities.

How many people are in your information systems department?
Around 850. That's somewhat of a misnomer because that 850 includes the purchasing and forms graphics operations. Also, we manage the buildings. We're running the project to build the new building.

Why?
It's been reasonably well accepted in the company that MIS has the greatest pool of project management experience. It's typically where projects of any significance are led. About 25% to 30% of the staff in the home office is information systems staff, so we're by far the biggest operation at that location.

Also, we were running the existing facilities, so it seemed like a logical thing.

I think it's a pat on the back, too, that the CEO thinks we can do it. That's why I say "information systems" is a bit of a misnomer. If anything, I think it should be "information systems and services."

Who is your boss now?
Roger Edgar. He runs the information systems department.

Is he the chief information officer?
If you want to use that term, it's probably where to use it in this company, but we don't use that term.

Why not?
The time will come when we decide that we need a CIO, and then we'll define what a CIO is, what the job entails. It may turn out Roger's job covers only 35% of what we feel needs doing then.

What is his title?
Vice-president of information systems. His efforts are split between the technical and nontechnical areas of the department, with the nontechnical area probably the more difficult to manage at this stage of IDS's growth.

What is the status of personal computing in the executive suite at IDS? Do the top executives use the technology?

> I HAVE this strange feeling that keyboards are something that only happens to be there now because it's the best way to input things. It won't be that long in the corporate time frame for voice recognition to be the most important input.

Yes, they do. Remember, they're all Profs-oriented. They're beginning to get used to the idea of electronic mail. They're all information-oriented, very analytical, want to know lots of information.

But I don't believe that personal computer technology is at the point yet where you can expect a CEO or a senior manager to sit down and learn it to the point where it becomes a daily habit to use it.

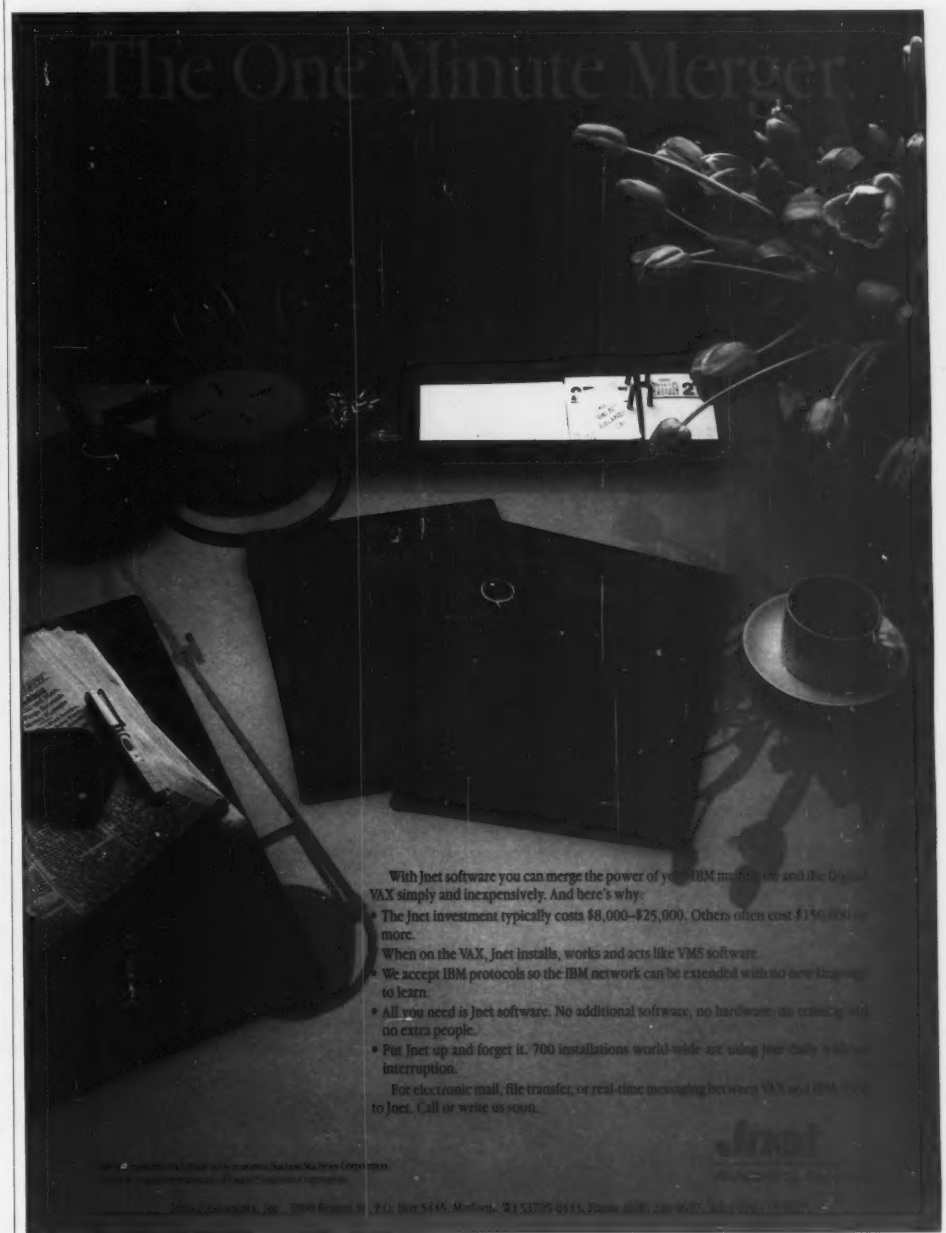
Where does PC technology have to go before it is suitable for that, in your view?
I can only talk from my perspective here, but the first thing is that it has to be customizable. The technology should fit the user, not the user fit the technology. Right now, I have to fit the technology.

If it were me, I'd want a keyboard with two keys on it — "Stop" and "Start." Actually, I think we came up with a third key last week — "What's new?"

I think things like voice recognition are going to revolutionize PCs. I think it's the interface that is wrong. It's not the PC that's inadequate.

Is it the keyboard that causes the problem or the software interface?
Both.

What would you like to see?
I'm a particular fan of the Macintosh-like menus by Apple Computer, Inc. When I see a trash can on my screen, I know if I do


The One Minute Merger
With Jnet software you can merge the power of your IBM mainframe and the Digital VAX simply and inexpensively. And here's why:
• The Jnet investment typically costs $8,000–$25,000. Others often cost $150,000 or more.
• When on the VAX, Jnet installs, works and acts like VMS software.
• We accept IBM protocols so the IBM network can be extended with no new language to learn.
• All you need is Jnet software. No additional software, no hardware, no training and no extra people.
• Put Jnet up and forget it. 700 installations world-wide are using Jnet daily without interruption.
For electronic mail, file transfer, or real-time messaging between VAX and IBM, come to Jnet. Call or write us soon.

something it's going to disappear in the trash.

I'm also a fan of the mouse because I don't type very fast. That will change, because as those who are used to typing get higher in the organization, then keyboards will be fine. But I have this strange feeling that keyboards are something that only happens to be there now because it's the best way to input things. But it won't be that long in the corporate time frame for voice recognition to be the most important input.

But if the software does not change, voice recognition won't help, will it, because users would still need to know the correct syntax to speak in?
The software has to move, too.

Voice recognition plus natural language processing?
Right. So I'm talking about bigger and faster machines, multiprocessors and those sorts of things.

Do you think there will be a point when it's worth spending that kind of money to get a good interface to the executives?

> EVEN the PCs don't sit still long enough. I'm going to have 10 million to 12 million instructions per second on somebody's desk out there in four or five years.

Yes. I think the other issue is data availability — having to key data that's on the mainframe into PCs. That interface is not clean yet.

And my answer to that is the architecture. If I architect the data and I have an active central data dictionary that tells me where all that data is, then sooner or later I'm going to be able to plug a PC into this dictionary and have tools on the personal computer that will work in logical views of data. It will then go out and fetch the data, unseen.

If you had that, do you feel the executives would use it because it would make the data available to them?
Right now, I believe it takes too much of a commitment of time and energy to learn and to keep learning. Anybody that's got a personal computer tends to know Lotus Development Corp.'s 1-2-3 or one of the others. The newer products from Lotus all operate the same way, so I can use most of them.

But bring along another product that doesn't operate the same way as Lotus and I'm lost, speaking as an executive. Then you're back in learning mode again. I just don't know how much we can expect those folks to keep relearning something they thought they already knew. The industry has to put this common infrastructure on the front of a PC.

Are you talking about an industry-standard interface for packaged software?
Right. But I don't know if that will ever happen.

It's not anybody's fault; it's a maturing piece of the business. Even the PCs don't sit still long enough. I'm going to have 10 million to 12 million instructions per second on somebody's desk out there in four or five years.

How do you personally use computers day to day?
I have a 3270 Personal Computer in my office, and I have a PC AT at home. I use them all the time.

I use Profs, I use 1-2-3, I use [IBM] Displaywrite. I do my own graphics, like overheads, for presentations.

What about accessing corporate data for ad hoc reports?
Well, I'm not allowed. We have a pretty tight security operation, and I have no justification to see customer records.

Aside from personal computers and their interfaces, what other technologies are not yet ready to run the kinds of applications IDS wants or needs?
The area of image bears heavy investigation. I don't want to have all those paper application forms from customers roaming around the company, so I'd like to just take a photograph of it and call up the image when I need it. I'm talking about a digitized video image, not like a microfiche.

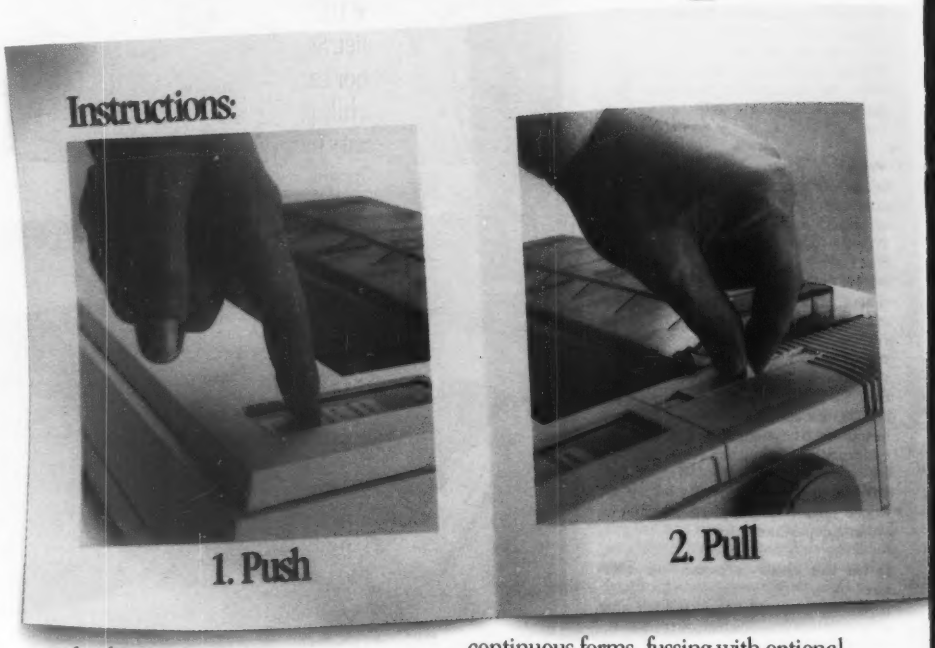
Then, the merging of text and image on a screen is still not where I want it to be.

Also, I think of expert systems in general, however you define them. I prefer to think of it as a personal assistant that helps you through decisions. But the machine power you need to do anything decent is expensive, and the software is still in the labs, really. We're all experimenting with it.

Is that under the domain of the Advanced Systems Group?
Yes. Our Advanced Systems Group of about 30 people looks at anything that might benefit the company.

You said there was about a 1-to-1 ratio of workstations to people in the home office but that some people are still going to use dumb terminals. Do you feel that the majority of those workstations

Switching from computer letterhead is as simple as



Push a button.
Pull a lever.
Push a button.
That's how easy it is to switch from computer paper to letterhead using a Fujitsu DX2000 series printer.

With the built-in bi-directional tractor, continuous forms feeding is easy and efficient.

No other 9-wire dot matrix printer can handle paper so easily. There's no wrestling with continuous forms, fussing with optional tractors or wasting time loading and unloading paper. And for big jobs, automatic feeding of cut sheet paper is simple with the optional, single-bin sheet feeder.

New Printers Offer Faster Speeds.

You get four printers to choose from in the DX series, the DX2100 and DX2200, plus our new DX2300 and DX2400.

The new printers produce up to 135 lines of copy per minute. Or an average size memo in draft quality in just 11 seconds.

are appropriate already?
I think workstation technology is evolving pretty rapidly right now. And no, I'm not satisfied that what we've got there is what we need. But I don't believe the PC is the answer either.

Is there a specific multiyear goal to ensure that the right workstations get onto the right desks?
Yes. The Advanced Systems Group continually puts together new arrangements of workstations. These days it tends to have to be a personal computer, because it's the only device really available to run local software.

There are some directives: We know there's got to be local processing on a workstation. We also know there's got to be mainframe connectivity. That gives you a good boundary to work around. From then on it's a matter of the right type of input devices and output devices and the right type of processing.

> I WOULD expect [future DP managers] are now in the customer service area somewhere. They are probably getting an MBA in information systems. They're probably not working for an information systems department.

We hear a lot about competitive advantage. How feasible do you think it is for the average DP manager to create a system so strategic that it gives his company a competitive edge?
I would say it's very feasible, but I would also agree that mostly they happen by accident. I would say our raison d'etre is to be an enabler.

MIS as an operation is not strategic. We don't do strategies — we enable strategies.

We were first on the market, for instance, with a consolidated statement, a true consolidated statement at the household level. Yours and your husband's accounts would all be put together with a summary of every product you had with IDS. That turned out to be a tremendous benefit to our customers and our marketing area.

When was that?
March 1985. That accomplishment was pure technology, but it was intended to enable the strategy of the field, which was to communicate to clients in a consolidated way. So I have a hard time seeing that as a system that was designed to be a competitive advantage.

But isn't the consolidated statement a perfect example of the benefit of a unified data architecture?
Oh yes, and it did create a competitive advantage for us. But I would never allow it to be said that MIS created something that gave us a competitive advantage.

Where does this type of breakthrough come from?
I would have to say they come from all over that place. I can't imagine any single process that would create those wonderful ideas.

What you have to do is make sure all those processes are in place. You have to make sure that people can present ideas and won't feel frustrated if they fail. And you also have to get the brains in the organization together once in a while and just let them run to see what they come up with.

What should future MIS managers be doing now?
Understanding what quality is. Understanding what service is. Because I think — I even hope — that the future data processing manager will be less of a technician and more of a businessman than even I was, and I've tried deliberately not to be a technician.

I would expect they are now in the customer service area somewhere, or they're out running a field-marketing or sales force. They are probably getting an MBA in information systems.

They're probably not working for an information systems department now.

Some people in your position name productivity increases as their No. 1 concern. Others say it's security. Would you rank either of those as No. 1?
Well, in my business I'm allowed to have several No. 1s.

No, I would not rank either as No. 1. I think those are both part of running my business, so I have to care about them — therefore they shouldn't be a priority, right? The things you should make a priority are the things you typically might not care about in the way you run the day-to-day business.

Day to day I'm confronted with issues like security, whereas something like an architecture and an infrastructure — maintaining the integrity of that, keeping it true to the mission — I think is the most important thing. In other words, managing the data to meet the needs that aren't there yet. Because when the PC revolution really does happen, when we get user-friendly software on the PCs, I'd better be in a position to give access to corporate data pretty fast, pretty easily. •

paper to 1...2...3.

3. Push

Easy to install color kit lets you print in seven brilliant colors.

Quiet, Reliable, Compatible.

The DX2000 printers are quiet. So you and your neighbor can think and talk comfortably even while printing lengthy reports.

What's more, they're rugged by design. And can give you about five years of trouble-free printing without asking for a holiday.

Which saves you time. Money. And lots of frustration.

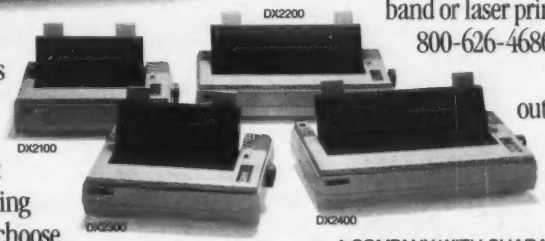
That's not all. Each printer is compatible with the most popular software packages, using Epson® FX80, JX80, IBM® Graphics Printer® or IBM Proprinter® commands.

Plus, the entire Fujitsu DX2000 series is surprisingly affordable.

Call for more information and a demonstration of the DX2000 series or any of our complete line of daisywheel, dot matrix, band or laser printers.
800-626-4686.

Then find out how easy it is to make the switch.

Print speeds range from 44-54 characters per second in near-letter quality mode, to 220-324 cps in draft quality mode, depending on which model you choose.



Each printer can handle letters, spreadsheets, descriptive charts and professional graphs. Plus, you can get an easily-installed option for 7-color printing.

The DX2000 series makes you more efficient. More productive. And more professional.

A COMPANY WITH CHARACTER

FUJITSU

FUJITSU AMERICA
Computer Products Group

Epson FX80 and Epson JX80 are registered trademarks of Seiko Epson Corporation. IBM Graphics Printer and IBM Proprinter are registered trademarks of International Business Machines Corporation.

© 1987 Fujitsu America, Inc.

THE VISI
NEED TO

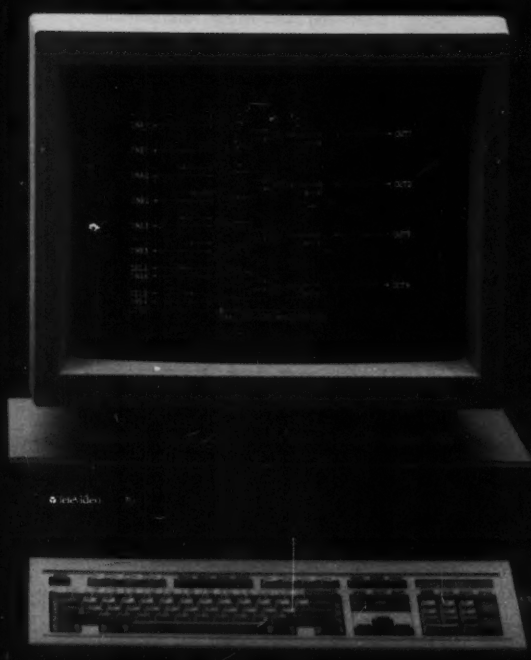
The New 965
Display Terminal

The New TeleNIX/386

Here's a look at the best news at COMDEX. The most complete line of
386's available. Plus the most advanced, most affordable high-performance

ON YOU SUCCEED.

The New 386
Engineering Workstation

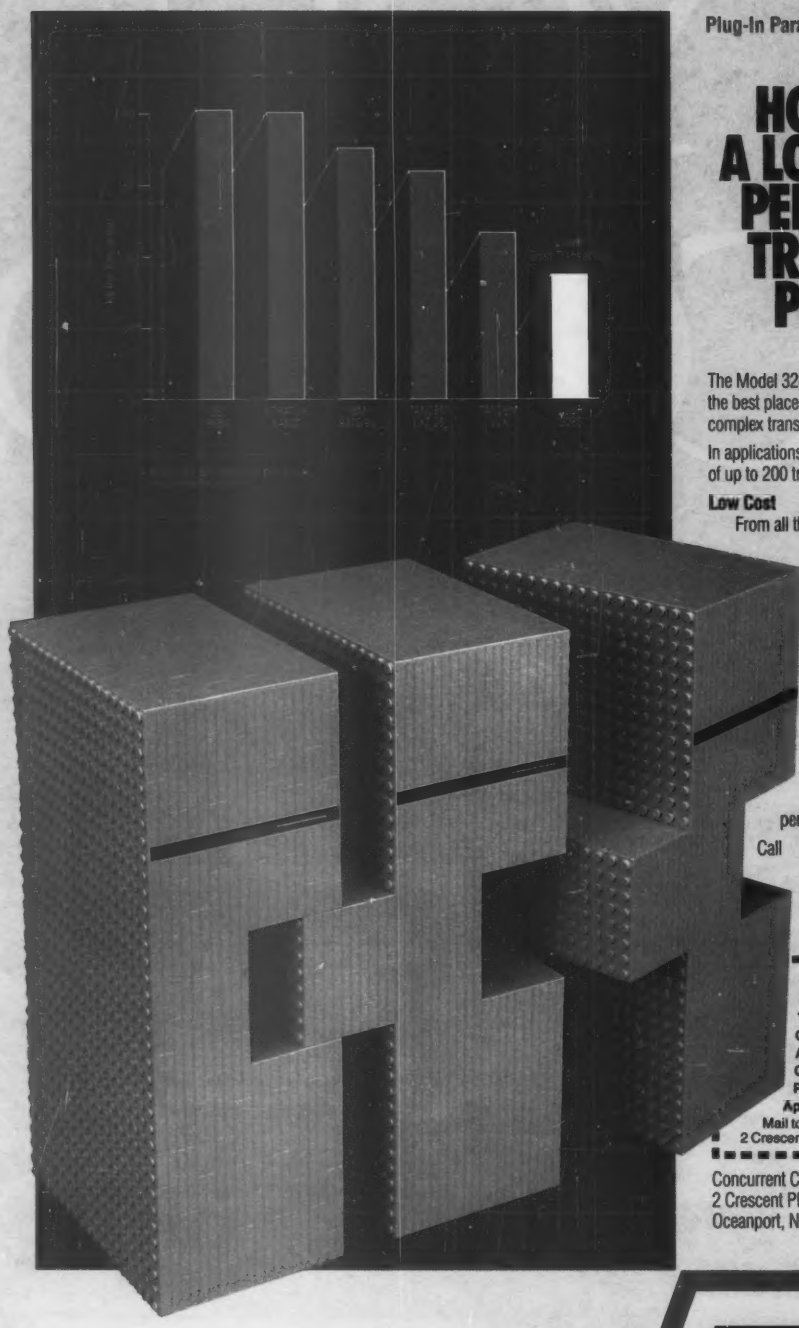


The New Tele/386

terminal you've ever seen. Stop by our booth, or call us at 1-800-835-3228.
It could be the first step on the path to success.

TeleVideo®

COMDEX BOOTH #940



Plug-In Parallel Processing

HOW TO BUILD A LOW COST, HIGH PERFORMANCE TRANSACTION PROCESSOR

The Model 3280 from Concurrent Computer Corporation is the best place to start. It has the power to handle up to 30 complex transactions per second.

In applications such as ATM, POS and lottery systems, rates of up to 200 transactions per second have been achieved.

Low Cost

From all the benchmarks we have run, including the industry standard ETI debit/credit benchmark and a variety of application relevant tests, the 3280 yields the lowest cost per transaction of any on line system available today.

Expandable

With our family of compatible systems, you won't run out of power when your applications grow.

We offer a high degree of IBM (SNA) and ISO connectivity as well as a full set of communications networking facilities. So, you don't have to sacrifice functionality to get cost/performance.

Call

1-800-631-2154

or write to:

Give me the proof.

Name_____
Title_____
Company_____
Address_____
City_____ State____ Zip_____
Phone ( )_____
Application_____

Mail to: Concurrent Computer Corporation,
2 Crescent Place, Oceanport, N.J. 07757 CW

Concurrent Computer Corporation
2 Crescent Place
Oceanport, NJ 07757

Concurrent Computer Corporation

All action, no talk?

Communication with end users can go beyond newsletters and emergency phone calls

BY ALAN RADDING

The concept that MIS's primary role is as a service to end users is gaining widespread acceptance. At the same time, however, communication between MIS and end users remains limited. Within MIS, communication is often state of the art, utilizing sophisticated electronic mail and the latest open management techniques.

At the highest levels of end-user departments and MIS top management, good communication can be found as MIS begins to increasingly participate in the overall strategic planning. "I sit in on all strategic planning meetings and listen to what top management needs," one MIS manager says.

But communication beyond the strategic planning stage is often limited to initial training and occasional retraining of end users, infrequent memos or newsletters and crisis management, usually in the form of a frantic telephone call.

The current communication problems between MIS and end users are caused, in large part, by the rapidly changing positions of both parties, neither of which are able to fully appreciate where the other stands. Problems are also created by the failure of both sides to appreciate that MIS is as much a part of the organization as sales or production.

Saving the best for last

Ironically, what management experts consider to be the last of the communication strategies typically attempted in MIS-end user relationships — placing MIS personnel into end-user departments — is becoming one of the most quickly and actively embraced. Experts offer two reasons to account for this. First, the growth of departmental computing is creating more opportunities for MIS within end-user departments. Second, many MIS professionals see a move into end-user departments as providing new and more open career paths.

Ted Smith, manager of systems development at Union Carbide Corp. in Danbury, Conn., is enthusiastic about the breakdown of barriers between end users and MIS at his company. The firm is decentralizing its computing. "There isn't much of a central computer any more. We've gone from mainframes to minis," he says.

At Union Carbide, technical staff is being placed in business departments. These MIS people report to the functional manager, such as the manager of accounts receivable. "We're putting the technical people a lot closer to the end users. It really improves mutual understanding," Smith says.

With MIS professionals working inside Union Carbide's departments, end users report that computing has become easier. "They can get things done much better than before because there are no barriers to communication," he says.

Smith notes that the blending of technical employees and end users not only aids communication but also gives his technical staff different career opportunities. The few problems that do arise with integration originate from technical people who are not prepared to let go of the professional MIS approach. "Some tech people are purists, and they have difficulty understanding and communicating with end users," he says.

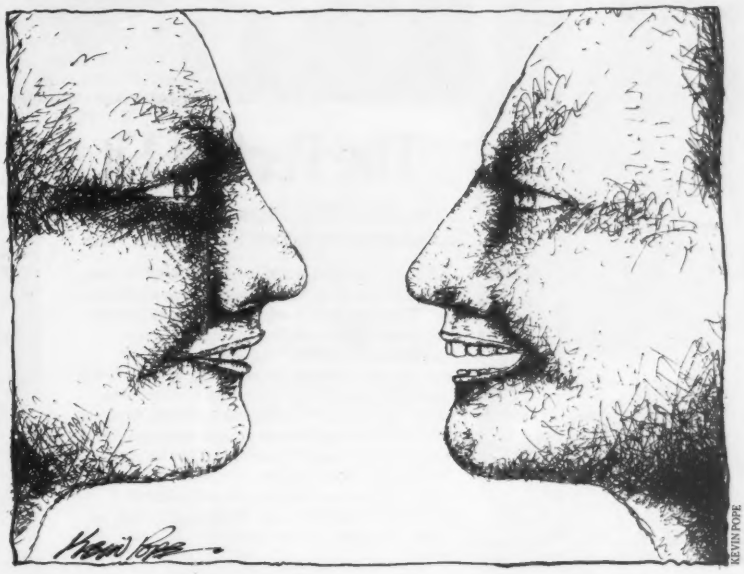
To aid communication, Union Carbide encourages face-to-face meetings. Steering committees meet monthly; when an especially difficult issue arises, the committee may meet more often.

In the ideal business environment of the future, no communication problems will exist because there will be no MIS department serving end users at all. MIS will pervade the entire organization, and end users will be as conversant in the fundamentals of MIS practices as many professionals are today in basic marketing or proper cost accounting.

Shape of MIS to come

"In the future, MIS will be totally integrated into the business. There will be no MIS professionals as we know them today, except for a small core of people who deal with architecture" and other highly technical details, says Eevelyn Arkush, a principal of the Index Group, a Cambridge Mass.-based computer management consulting firm. There will be no communication problems as they exist today, because there will be no operational separation between MIS and end users.

The elaborate restructuring of MIS departments in many organizations is evidence of MIS's



KEVEN POPE

Radding is a Boston-based author specializing in business and technology.

- **Rapport is key to influence**
- **When end users aren't suspicious of MIS**
- **Face-to-face meetings preferred**

natural evolution. The importance of MIS in many organizations is the very reason for its breakdown as a distinct function. Ultimately, MIS is too important to a business to be left in the hands of the high-tech priests, Arkush says, noting that end users inevitably will absorb MIS into their daily business activities.

In the aftermath of the widespread acceptance of personal computers in the corporate environment and the corresponding loss of MIS's centralized control of all computing, many MIS departments are regrouping, evolving new strategies to meet all aspects of business computing and reasserting some influence over end-user computing. Industry consultants see this change simply as the next stage in the inexorable evolution of pervasive, end-user-dominated MIS.

The Index Group likes to illustrate the evolution by charting the changing status of the end user. By understanding the positions of both parties in the relationship, the dynamics of the communication issues become apparent.

Utility. Initially, the end user was the victim of a centralized, impervious MIS department concerned almost solely with carving a niche for the new electronics technology in the business environment. There were no end users at this stage: They had not been invented yet. The objective was to sell the idea of computers to top management, the end users of the time.

Once the computer was established as a part of the organization, the MIS department operated like a utility company, the primary function of which was to keep the machines functioning and the work, whatever it might be, flowing. The end user was relegated to the status of an anonymous consumer of a monopolistic utility's output. MIS provided raw computer processing on a take-it-or-leave-it basis. Communication was one-way. A few organizations remain at this point today, but most have evolved.

Retailer. Then personal computers arrived, and end users realized they could have a say in computing. They did not need MIS if MIS was not going to be cooperative. This led to the next stage — the retailer model. Responding to the surge in end-user computing and becoming aware of alternatives, the MIS department acted like a department store, offering a selection of technologies and applications.

In the retailer model, communication is usually direct, with the end user coming to MIS for equipment and technical information. MIS is beginning to listen to what end users are saying, but it has only a rudimentary idea of what end-user computing is doing for the business.

Consulting firm. As communication improves and MIS realizes that it must become actively engaged in end-user computing, the consulting firm model will evolve, with end users as the clients. At this point, MIS personnel is developing expertise in the client's actual work and can be found out in the field — the end user's territory. A number of organizations already have reached this stage. To some MIS managers, this is where the conclusion should come to its natural evolution.

Partnership. But the evolution process will not stop there, management experts say. It will continue into yet another phase — the partnership model. In this phase, MIS and the end user are equal partners in the business of the organization, equally concerned about the organization's product or service and equally responsible for the organization's success. Communication between MIS and end users is constant and interactive at many levels. MIS personnel is thoroughly familiar with the business of the organization and takes a proactive role in working toward the company's success.

> IN A partnership, MIS and the end user are equal partners, equally concerned about the organization's product and equally responsible for the organization's success.

Integration. Only then, the experts say, will MIS move to the final stage in its evolution — pervasiveness. End users will be so well informed about MIS and MIS personnel so integrated into the daily business operations that MIS, except for a small core of advanced technocrats, will cease to exist outside the end-user environment. Communication problems involving MIS will evaporate because no split will exist between MIS and general management.

Looking for what works best

Most companies are in the position of New York-based Metropolitan Life Insurance Co., which moved beyond the utility model and is wrestling between the retailer and consultant models to find which works best. "We're decentralized from corporate [management], but we're still centralized unto ourselves," says Robert Hufnagel, director of investment systems and technology for the company's Investment Information Division. However, he adds, departmental decentralization is already under discussion.

The proliferation of PCs has spurred many of the computing changes at the company, but Hufnagel expresses concern about this expansion.

"It's not distributed processing," he says. "[End users] do a lot of downloading, but they are reinventing the wheel" by creating redundant — and not necesarily accurate — data.

In order to communicate with end

The Perfect Fit

Only PINSTRIPE™ Human Resource Software Packages Come Tailored For Individual Needs

At Lawson, we don't have a one-size-fits-all policy. Our policy is to ensure your complete satisfaction. With a commitment to do "Whatever It Takes," Lawson provides Human Resource software packages with the flexibility to fit your unique requirements. PINSTRIPE™ Human Resource software packages offer the features you want and the benefits you need for complete control of your Human Resource department. Complying with the new COBRA and flex benefits regulations, PINSTRIPE™ Human Resource packages integrate to form a comprehensive Human Resource System. And like all our PINSTRIPE™ software packages, they come with a complete array of client services. For more information on new PINSTRIPE™ Human Resource, Accounting or Distribution software packages, call your Lawson representative at:

LAWSON ASSOCIATES INC.
2021 East Hennepin Ave., Minneapolis, MN 55413
1-800-672-0200
IBM and Unisys mainframes, IBM S/38

LAWSON

...WHATEVER IT TAKES!

users, the MIS department has created support groups drawn from the end-user departments — in effect, grooming departmental computer gurus. End users are communicating MIS information to end users. MIS's own operations people concentrate on "keeping a rein on the technology," Hufnagel says, and do not actively enter the end users' domain. When MIS communicates directly with end users, it does so via electronic mail, memos and meetings.

By comparison, The Hartford Life Insurance Co., a Hartford, Conn.-based insurance company, recently completed a reorganization that puts MIS into direct contact with end users and involves MIS in the daily business of the company. While retaining its own identity to handle the technical aspects of operation and installation, the Information Management Division established a separate group, Customer Automation Support, to operate as a service organization or consulting firm for the business and product divisions, according to Jack Crawford, director of information management.

The customer automation support group acts as a single point of contact for end users, Crawford says. The computer personnel act as specialists who focus on applications solely for the end-user community. These people are posted to end-user departments, but they retain their computer specialist identity and thus do not really represent full system integration with the business departments. In this respect, MIS at The Hartford has reached the consultant stage.

Whence goes the info center?

A good example of the difficulty of solving the communications issues between end users and MIS under such fluid conditions is the corporate information center. Originally, the information center was conceived as a way to communicate directly with the end user. The strategy was to designate an entity much like The Hartford's Customer Automation Support group.

This group would facilitate end-user computing by directly assisting end users in their computing efforts. It would be a supreme liaison between end-users and MIS. Some information center models even called for the creation and maintenance of a central data base and a computer store where end users could choose among preapproved hardware and software.

The concept has been widely embraced, and dozens of models, each varying slightly from the others, exist, but the information center has not become the ultimate communications solution. Metropolitan Life has tried several approaches to the information center, Hufnagel says, but has yet to hit on something satisfactory.

The problem with the information center, says Index Group's Tom Davenport, is that it was created to provide end users with technical rather than business support. End users do not want to know just what buttons to push; they want to know how to use the machines to do their business, and "the people in the information centers may not be able to do that," he explains.

Index Group's Arkush says she believes that the information center outlived its usefulness even as it was gaining widespread acceptance. "Today's end users are much smarter, and they have much more peer support. There is no need for an information center when end users can turn to the person at the next desk [for answers]," she says. There may be more expertise among end users than there is at the information center.

What may actually doom the information center faster than anything else is the changing perception of its value to the organization. At a time when organizations are looking to cut costs and streamline, "there is no way to pinpoint the cost benefit of the information center," Arkush says. What dollar value can you put on an outdated mode of communication?

End user behind the wheel

More often than not, end users have been driving the changes in end-user computing with MIS following behind, either enthusiastically, reluctantly or somewhere in between. William Chelmowski, DP manager at the Corinth, Miss., location of Krueger-Ringier, a leading printer of

WIN A FREE COMPUTER AT COMDEX

More readers get more computer information from IDG Communications publications than from any other source.

Guess how much, and win a free computer at COMDEX.

With more than 80 computer-oriented publications in 29 countries around the world, we publish more computer information for more computer-involved people than any other organization in the world. In fact, we reach over 14,000,000 readers worldwide. And if you can guess how many pages of information we published in April, you could win the computer system of your choice (up to $6,000 retail value).

All you have to do is guess how many total pages we published in all of our publications around the world in April, 1987. You can enter by visiting our booth (#3208) in the West Hall at COMDEX Spring in Atlanta, or you can write to COMDEX CONTEST, IDG Communications, Box 9171, Framingham, Massachusetts 01701, for a free entry form.

To help you in your guess, here are some facts: IDG Communications publishes over 80 newspapers and magazines including, in the United States, *Computerworld, InfoWorld, PC World, Macworld, Amiga World, Publish!, Network World, Boston Computer News, Digital News, Federal Computer Week, inCider, PC Resource, Run,* and *80 Micro.* Typical issues range in size from 24 to well over 200 pages.

So, strike an average, multiply by the number of publications, and enter your guess. You could win a computer of your choice.

See you at COMDEX!

CONTEST RULES:

Only one entry per person. "Pages" are defined to include all pages printed, including covers, in any issue of a publication, with an April 1987 cover date, with the exception of bind-in and blow-in cards. The first entry drawn which is within 5% of the correct total will win. Employees of IDG Communications and their suppliers are not eligible to enter. Winner must agree to allow his or her name and picture to be used in publicity surrounding the contest. All entries become the property of IDG Communications, and IDG Communications will be sole judge of the winner. Winner will be drawn at the conclusion of COMDEX. All entries mailed in must be received in Framingham, Massachusetts, no later than May 20th, 1987. Entries will be accepted at COMDEX until noon of the last day of the show. Prize will be the computer of the winner's choice, with retail value not to exceed $6,000.

IDG COMMUNICATIONS

The world's largest publisher of computer-related newspapers and magazines.
An International Data Group Company

UNCOVER 25% MORE S/38 MEMORY.

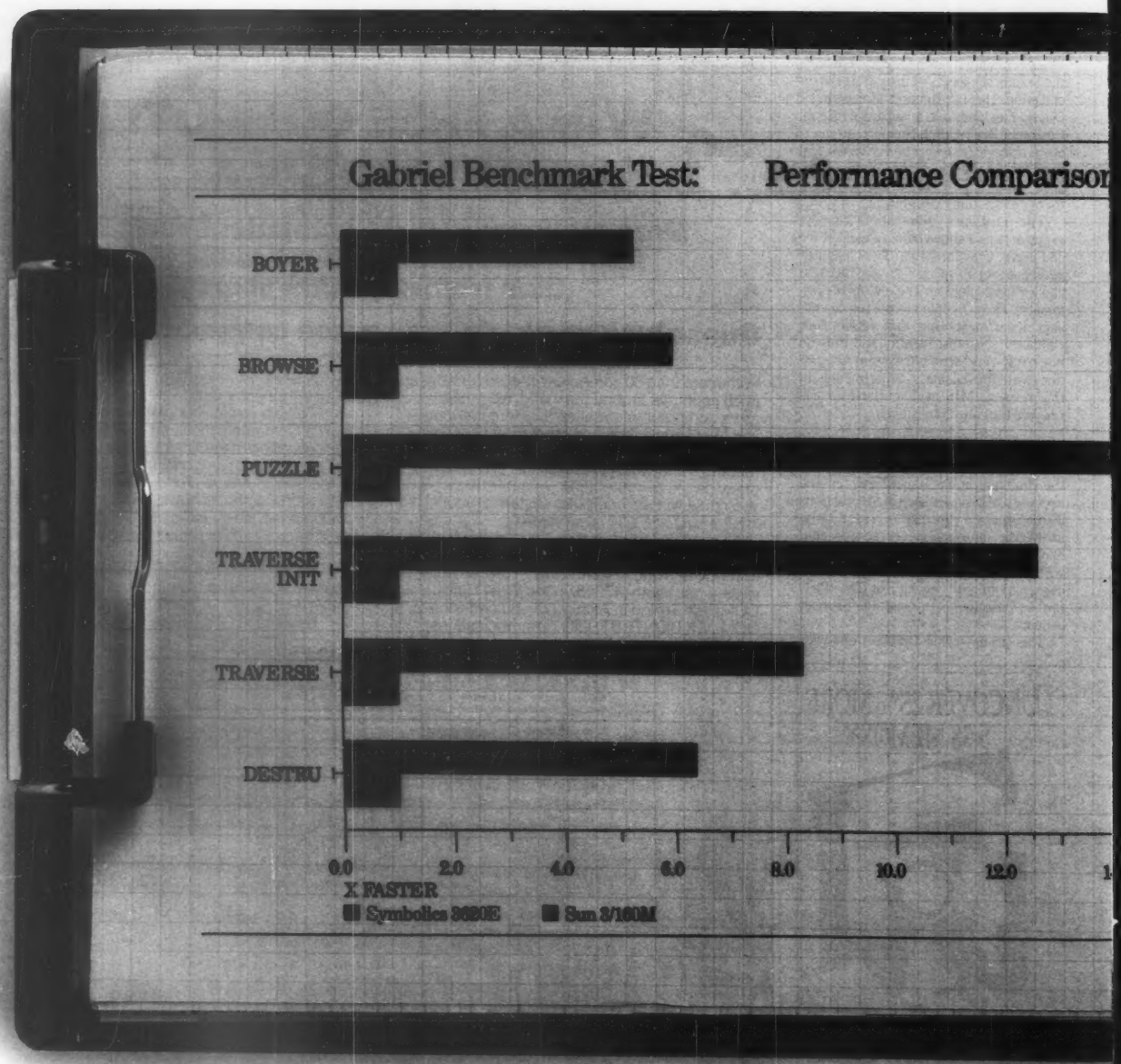
AUTOTUNE gives you expert performance tuning every 10 seconds for just $1750.

AUTOTUNE monitors system use at any interval you specify, and then adjusts memory pools and activity levels accordingly. Result: it's like having 25% more memory. And that means faster response time.

Call toll-free for your free demo diskette and user guide: 1-800-328-1000, ext. 125.

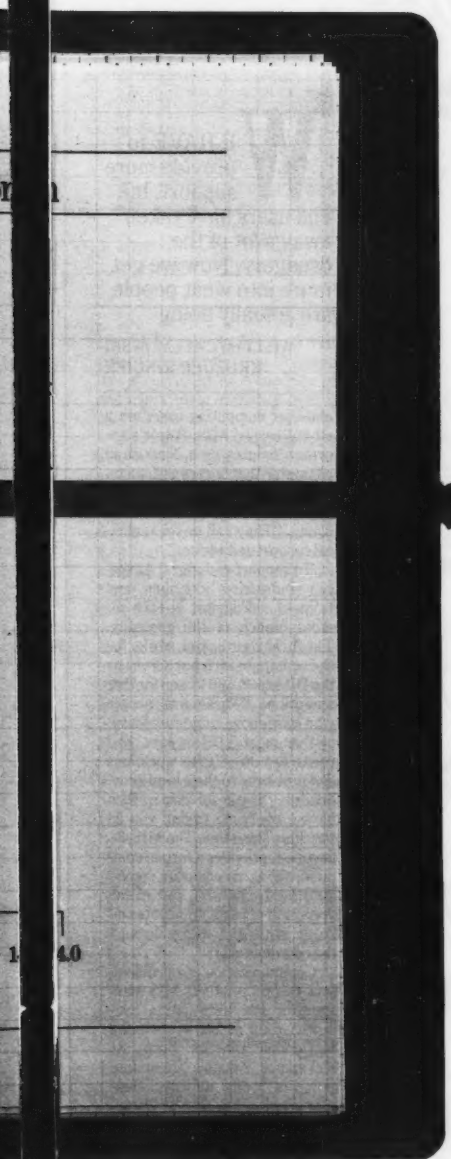
HELP/38 SYSTEMS
210 Baker Technology Plaza
6101 Baker Road, Minnetonka, MN 55345
612/933-0609 Telex: 290184

What do you ex



Symbolics, Symbolics 3620 and Genera are trademarks of Symbolics, Inc. UNIX is a trademark of American Telephone and Telegraph.

pect for $36,000?



From Symbolics, you can expect the fastest AI and advanced software development workstation in its class.

To prove this, we matched our 3620E in a standard benchmark test with a representative workstation from the same class.* The results, as you can see, weren't even close. Symbolics ran anywhere from 5 to 34 times faster in every category.

Why Symbolics is so fast

Like other manufacturers, Symbolics supports IEEE 32-bit floating point and numeric processing. But we go a step further by adding four turbo-charged bits. When combined with our unique hardware architecture, these extra bits allow Symbolics workstations to compact applications data, automatically process different datatypes with built-in error detection, and process multiple operations in parallel for faster operation—faster than any other systems in their class.

In the real world of applications development, the true test of any system is not only its speed, but more importantly, the reliability of the information it processes. With all other systems, to get speed you must sacrifice the assurance of reliability. Only Symbolics gives you both.

What Benchmarks won't show you

Benchmarks only measure processing speed. The key ingredient to faster software development is programmer productivity. With Symbolics systems, programs can be developed from 5–50 times faster than with conventional workstations. That's because Symbolics' Genera™ software environment provides over 40 times as many built-in facilities as systems offering just a Common Lisp compiler. These pre-written "mini programs" shorten development time and increase reliability since programmers don't have to write them.

And Symbolics offers automatic data-type checking at run-time, advanced debugging, smart garbage collection, automatic memory management, the fastest edit-compile-debug loop available, and full support of object-oriented programming. These allow for rapid prototyping, and enable programmers to solve complex problems faster than ever.

Fast, reliable team-oriented software development

Symbolics also offers the fastest team-oriented software development—*even in multi-vendor environments.* That's because Symbolics supports a full range of industry standard protocols and languages to integrate AI into existing environments. X34 With one simple command you'll access information from, and communicate *transparently* with UNIX,™ Digital, and IBM® systems. And using Symbolics workstations, you'll write software fast, in Common Lisp, Prolog, Fortran-77, Pascal or Ada.®

Best price/performance

Getting up to 34 times the performance from Symbolics won't cost you more. In fact, Symbolics lists for less than most other systems in every class. And as you go up in class, the price difference becomes even greater.

Give us a call today. We'll tell you how Symbolics can greatly reduce your time to market for new products, and your costs, through increased programmer productivity and the best price/performance workstation available.

Symbolics. 11 Cambridge Center, Cambridge, MA 02142.

1-800-237-2401

In Colorado: 1-800-233-6083

*Comparably configured and priced systems.

symbolics™

IBM is a trademark of International Business Machines Corporation. Ada is a registered trademark of the U.S. Department of Defense.

paperbacks and magazines, has watched the growth of end-user computing for eight years and hears the message from end users loud and clear. He says the growing emphasis on end-user computing is a change for the better.

At Krueger-Ringier, Chelmowski oversees the use of CRTs linked to the corporate mainframe in Chicago. In addition, dozens of PCs are scattered throughout the departments. The departments purchase and are responsible for the PCs, although end-user requests for equipment are passed by Chelmowski.

Still, as DP manager, Chelmowski says he finds he is called on to assist with end-user computing. Although, he says, there is no formal communications program, DP managers throughout the company try to work with end users, often one-on-one, when asked.

A formal program was established to involve end users in corporate computing. "When we started, all inputting was done by DP," Chelmowski says. "Now, more than half of it is done by the people who create the input."

The DP department trains those end users at formal one-time training sessions and supervises them when actually working on a CRT; otherwise, end users are supervised by their department. End users are given additional training only when there are new applications to learn or if a problem arises.

Communication among DP managers and end users is frequent but informal — usually in-person or by phone. A newsletter for PC users is published, Chelmowski adds, but he says he has little to do with it.

Chelmowski welcomes his increased involvement with end users, although it offers drawbacks as well as advantages. "We have to provide more support," he says, "but they've taken away a lot of the drudgery. Now we get more into what people are actually doing. It's more interesting. It's not just numbers coming through."

A centralized approach

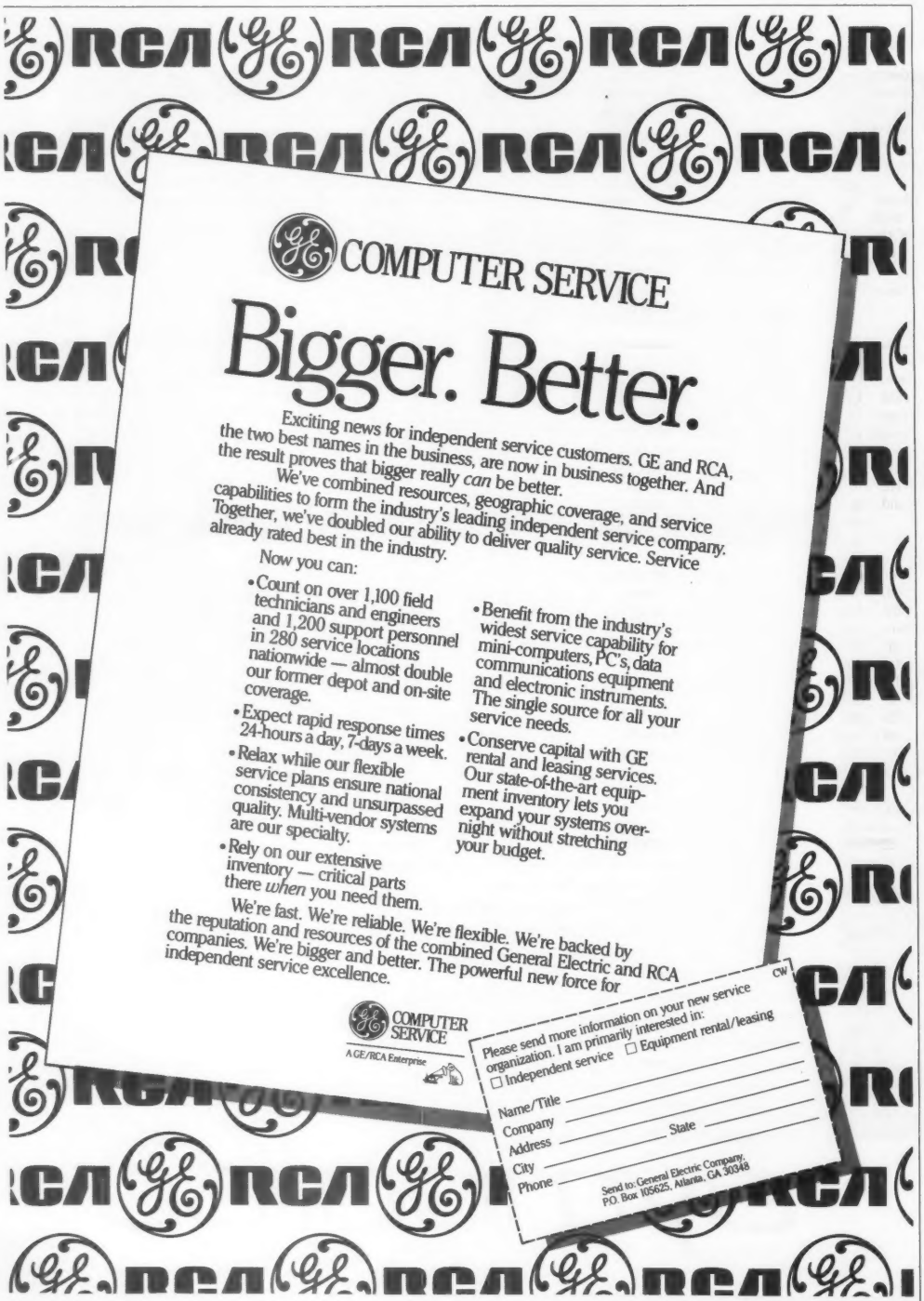
Larry Potter, DP manager at Portland, Ore.-based American Industries, is a strong believer in end-user computing based on a strong central MIS. Potter's approach focuses on a centralized computer that serves end users. "My philosophy is that the system belongs to the users," he explains. "They call us for technical support and advice."

> "WE HAVE to provide more support, but end users have taken away a lot of the drudgery. Now we get more into what people are actually doing."
>
> WILLIAM CHELMOWSKI
> KRUEGER-RINGIER

To support end users, American Industries identifies and trains a coordinator in each remote branch of the company. The local coordinator works for the remote branch but serves as the DP expert and liaison for that operation. "These are people who have more computer literacy than most," Potter says. End users can then take questions and problems to their local coordinator. "It's a lot easier than having everyone calling you all the time," he notes. The MIS department provides a formal communications mechanism involving an internal mail and memo system. It also communicates directly with end users through the coordinators.

Communication is a problem, says Gerald Sexauer, MIS manager for the Information Systems Group at St. Louis-based McDonnell Douglas Corp. At McDonnell Douglas, communication is pretty informal, Sexauer admits, but that is changing. "It used to be formal. Then it got pretty loose. Now we are tightening it up again," he explains.

Sexauer's department maintains no authority in the purchase or use of PCs by end users, but it is regrouping now to restore the loss of data control. The data issue arose when end users started churning out their own information, information


COMPUTER SERVICE
Bigger. Better.
Exciting news for independent service customers. GE and RCA, the two best names in the business, are now in business together. And the result proves that bigger really *can* be better.
We've combined resources, geographic coverage, and service capabilities to form the industry's leading independent service company. Together, we've doubled our ability to deliver quality service. Service already rated best in the industry.
Now you can:
• Count on over 1,100 field technicians and engineers and 1,200 support personnel in 280 service locations nationwide — almost double our former depot and on-site coverage.
• Expect rapid response times 24-hours a day, 7-days a week.
• Relax while our flexible service plans ensure national consistency and unsurpassed quality. Multi-vendor systems are our specialty.
• Rely on our extensive inventory — critical parts there *when* you need them.
• Benefit from the industry's widest service capability for mini-computers, PC's, data communications equipment and electronic instruments. The single source for all your service needs.
• Conserve capital with GE rental and leasing services. Our state-of-the-art equipment inventory lets you expand your systems overnight without stretching your budget.
We're fast. We're reliable. We're flexible. We're backed by the reputation and resources of the combined General Electric and RCA companies. We're bigger and better. The powerful new force for independent service excellence.
COMPUTER SERVICE
A GE/RCA Enterprise
CW
Please send more information on your new service organization. I am primarily interested in:
☐ Independent service ☐ Equipment rental/leasing
Name/Title
Company
Address
City State
Phone
Send to: General Electric Company, P.O. Box 105625, Atlanta, GA 30348

Exiled in corporate America

BY GENE SHKLAR

Despite their growing number, corporate personal computer users have yet to enjoy full corporate citizenship. While PCs are becoming as ubiquitous as calculators, there is something almost clandestine about using a PC when a perfectly good mainframe is churning away downstairs.

The barrier is no longer connectivity: Micro-to-mainframe links have proven quite viable. Lack of power has been another stumbling block, but the advent of 32-bit microprocessors and 1M-bit memory chips has eliminated that argument, too.

The problem is that corporate America misunderstands the role of PCs, even after all these years. Each side of the aisle — the PC zealots and the MIS diehards — clings to cherished myths about the other.

Shklar is director of marketing of the PC product line for Oracle Corp. in Belmont, Calif.

The prevailing view among corporate PC users is that micro-to-mainframe connectivity, while possible to implement, amounts to icing on the cake. Meanwhile, MIS still sees the PC as an expensive toy, or worse, as an intruder eluding management control.

'PCs are too expensive'

One hard-to-kill myth still widely believed by MIS managers is that personal computers cost too much. The flaw here lies in comparing the cost of a PC with that of a terminal and assuming that both serve the same function. Not so. When you assess the cost of a terminal, you must also take into account the per-user cost of the host machine and its software.

Mainframes are an expensive proposition when compared with micros — so much so that transferring as many compute cycles as possible from the host to the PC pays off quite handsomely.

The Compaq Computer Corp. Deskpro 386, for example, delivers 4 million instructions per second (MIPS) for about $4,000. By contrast, a mainframe provides 1 MIPS for $100,000 or more.

'Few PC users need access'

However, if MIS underrates the worth of the personal computer, PC users underestimate the need to access the corporate data base. One analyst estimates that fewer than 10% of corporate PC users would ever require mainframe access.

In fact, not only is corporate data still stored mainly on the corporate mainframe, but nearly everyone in the company can already access it. However, this access remains grossly inefficient and indirect. Forget on-screen queries using fourth-generation languages. Most people access the corporate data base by reviewing reports and memos, which usually arrive in their in-basket weeks after the fact. Or they telephone well-connected colleagues and ask them for the information.

The fact is, you cannot be an effective corporate citizen without effective access to corporate data, and PC users should fight for electronic access as part of their bill of rights.

As micros continue to multiply, PC users' needs are becoming MIS's problems. Program development tools, such as data base management systems and compilers, are producing applications that can be run across the computing spectrum on mainframes, minis and PCs. Moreover, the distinction between PCs and mainframes is blurring. A 32-bit machine with 16M bytes of random-access memory and a gigabyte of local storage will soon become a common desktop accessory. How long can we continue to call this technology a "microcomputer"?

Finally, distributed data base management will take the tug-of-war out of personal computing. It will enable users to store local data bases throughout the company, close to their source and where they are used the most. But distributed data bases will appear to users as a single data base residing on a single machine, obeying corporate MIS rules for data security and data integrity. •

that MIS could not verify or reproduce. Now MIS is attempting to communicate its concerns, create a common data base and exert some authority over end-user PC operations.

The best approach, Sexauer believes, is to be indispensible to the end users. He assists end users who request help, and "eventually we help them all," he says.

Support rather than control

End users possess more corporate power then MIS because they are, in essence, the company. Personal computers are here to stay, and the number of end users who are proficient in the use of the machines increases daily. Departmental computing is putting more power into the hands of end users. Yet, the lines of communication between end users and MIS are vague and work best on an informal basis — face-to-face or on the phone. Beyond initial training, comprehensive, formal communication is the exception.

Many MIS managers indicate privately that communication will bring end users back under the control of MIS. Eventually, they say, even the best end users will get in over their heads and will have to come crawling back to MIS for help. Although these managers may be reluctant to express this thought publicly, the idea may, in part, account for the slowness in the development of MIS-end user communication.

Management experts advise against this attitude. Besides being crisis management at its worst, it does not create the kind of communication that leads to a successful long-term relationship. Neither does it take into account the growing support alternatives end users find.

"MIS could find itself locked out," Index Group's Davenport warns. He recommends instead that MIS constantly communicate and practice a support-oriented attitude rather than a control-oriented approach. When end users are not suspicious of MIS motives, they will be more likely to listen to what MIS has to say. •

Uptime

Provide 24 Hour CICS Service

IBM gave dynamic allocation to CICS... but you need Netec's CAFC to make non-stop CICS a reality. CAFC allows a single command to OPEN or CLOSE 5 or 50 files. CAFC establishes two way communication between your CICS regions and your batch jobs. Your batch jobs will always have the files they need for processing without operator intervention.

Let LCON manage your MVS Complex

The Logical Console Operator's flexibility and rock steady reliability allow it to schedule and manage your tedious, complex, and repetitive console chores. Everyone wins with faster response time, increased batch throughput, improved on-line service and more uptime.

Netec International, Inc.
P.O. Box 18538 • Dallas, Texas 75218
Telex 314419 TELECOM UD (214) 324-2848

Stop Software Surprises with TRAPS™

Somehow, a little programming change can take on monstrous proportions if you're not careful. And an undetected error can make a program look like a different animal altogether.

That's why we've developed TRAPS (Testing/Recording and Playback System) to detect unwanted surprises in your software *before* they cause trouble for your users.

With TRAPS, you can build and maintain test cases in multiple on-line environments—from CICS and TSO to IMS and DB2. TRAPS captures keystrokes and screens and provides consistent, repeatable playback of test scripts. And since TRAPS runs on a personal computer, you conserve host resources and bypass the installation and scheduling roadblocks of mainframe testing tools.

When you test with TRAPS, you get a high-quality product the first time around. And you won't leave users in the dark with unexpected surprises.

For more information on TRAPS or our other innovative software products, contact TRAVTECH at (203) 277-9595.

TRAVTECH Inc.
One of The Travelers Companies
One Tower Square
Hartford, Connecticut 06183

TRAPS™ is a trademark of The Travelers Companies.

Get the news when you can use it... and get off the route slip circuit!

Order your own subscription to COMPUTERWORLD for just 76¢ an issue — about what you'd pay for a morning's cup of coffee.

TAKING CHARGE

Efrem G. Mallach

Keep up with the Joneses

Strategic systems are the rage. The industry press is full of articles saying that computers can do more than run the payroll system and count corn flakes. Recently, *The Wall Street Journal* declared in an article that computers have found a role in buying, selling and reshaping businesses. The story discusses how computers can pull the mainstream aspects of a business together and integrate customer purchasing with suppliers' operations. If the *Journal* pays attention, can *Time* and *Newsweek* be far behind?

There's nothing wrong with strategic systems — or, to use the latest buzzword, mission-critical systems. American Airlines' sales gains from using the Sabre system are real. Customers can get addicted to using a computerized ordering system that happens to tie them to one distributor. I use my travel agent because he can find the lowest fares on his terminal and is willing to do so. Most competitive

Continued on page 92

Large firms move to consolidate operations

Cost-cutting prompts Sohio to centralize, integrate systems

BY JEFFRY BEELER
CW STAFF

DALLAS — In 1985, a major oil company resolved to cut the electricity consumption, support costs and number of employees at the scientific computing facilities it maintained both locally and remotely. The proposed cuts were in keeping with its continuing struggle to minimize its overhead whenever possible.

To achieve its goals, The Standard Oil Co. (Sohio) in Cleveland launched a concerted drive to integrate selected systems in its main technical data center, which opened here in 1981.

As part of its integration effort, the facility began attaching array processors to its scalar CPUs and increased its emphasis on connecting workstations to mainframes, according to site director Marion Bone.

At about the same time, Sohio conceived the idea of centralizing some of its other scientific processing resources, which until then had been dispersed throughout the U.S., by consolidating them in the Dallas installation.

In the two years since, the company's labors have begun to bear fruit. By increasing its emphasis on systems consolidation, the oil giant has been able to reduce its staff of key technical specialists, such as geophysicists, geologists, petrophysicists and reservoir engineers, according to Bone.

Previously, each of those disciplines controlled its own dedicated computing resources, many of which were housed in different locations. Sohio's reservoir engineering group, for example, relied almost exclusively for computing support on systems residing in the scientific data center at the company's Cleveland headquarters.

Moving sources

Now, however, the reservoir engineers draw their technical processing resources from equipment operating in Dallas. Other disciplines have also had their main sources of systems power transferred to the same installation, according to Bone.

As a result of its systems unification, Sohio's engineering and scientific computing activities are now supported from a single point, with all disciplines using common hardware. Such sharing, in turn, has enabled the firm to eliminate redundant systems — and many of the employees once needed to run them, Bone adds.

Although Sohio has greatly expanded the technical data center's workload, it has done so without adding to the facility's personnel. Since 1985, in fact, the installation's staff of programmers, operations specialists and other computing technicians has shrunk from about 85 to 65, according to Bone.

Continued on page 93

Nabisco seeking DBMS to enhance connectivity

BY JEAN S. BOZMAN
CW STAFF

EAST HANOVER, N.J. — When Nabisco Brands, Inc. merged with R.J. Reynolds Industries to form RJR Nabisco, Inc. in 1985, the resulting corporation inherited two primary computer architectures, several computing centers and a variety of data base formats.

RJR Nabisco has since decided to combine most of the data processing for its food products in a new 65,000-square-foot data processing facility in Wilkes-Barre, Pa., by this fall. The move will bring dozens of DP staffers from Nabisco's headquarters to the eastern Pennsylvania city.

The center is being built next to a 3-year-old, 80,000-square-foot DP and financial services center that handles all Nabisco Brands' accounting services. The company would not say exactly how many DP staffers will work at the two sites but estimated the number will be at least 200.

'Need more MIPS'

"The move is a reflection of the need for more and more MIPS [millions of instructions per second]," says Donald Brout, staff vice-president of information management systems for Nabisco. "But it is to be viewed as an expansion from our East Hanover facilities, which are about 100 miles away. We are not planning any layoffs or terminations because of it."

Brout says the company plans to move about 80 jobs, mostly in operations, to Wilkes-Barre and hire more computer room operators for the shop there. It will maintain its software programming staff in New Jersey and hopes to find positions there for employees whose jobs are moved but who decline to relocate to Wilkes-Barre.

By fall, RJR Nabisco will have three major U.S. data centers, Brout says. They include the Wilkes-Barre center, which will run an IBM 3090 Model 400 and a 3090 Model 200; a San Francisco-based Del Monte division facility with a 3090 Model 200 and an IBM 3083; and a Winston-Salem, N.C., shop that supports the firm's tobacco operations with four 3090 Model 400s. The East Hanover computer room now has a 3090 Model 200 and an IBM 3084.

In an attempt to bring order to a wide array of data structures, including IBM's IMS and Cullinet Software, Inc.'s IDMS, Nabisco recently decided to eventually migrate all of its data to a single relational data base format.

"We have made tremendous progress in moving towards common systems," Brout says. "But we now recognize that our world will probably not stop changing on the MIS side, and a relational DBMS will help infor-

Continued on page 93

Managers seek VDT ailment cures

BY DAVID A. LUDLUM
CW STAFF

Data entry operators complain of a variety of health concerns more frequently than clerical employees who work in their departments, according to the latest edition of an annual survey of VDT health hazards.

The data entry operators reported each of 11 symptoms more frequently than their clerical coworkers in response to the Data Entry Management Association's Third Annual VDT Health Survey.

And the statistics are "far from good" for the clerical workers, according to Norman Bodek, president of the Stamford, Conn.-based association, who said the high pressure of the data entry environment affects the health of clerical workers there as well as the operators.

"There's no reason for this many complaints. We have to look at conditions ourselves and then enlist top management's support to correct problems," Bodek said.

The survey, conducted last year, found that the frequency of health complaints declined slightly from the previous year, although reports of blurred vision increased.

Among the more commonly reported problems are painful necks and shoulders, cited by 66% of operators; back pain, cited by 57%; fatigue, cited by 51%; and irritable eyes, cited by 47%.

Taking action

About 55% of the data entry managers responding to an accompanying survey said they have changed office procedures to improve conditions. The changes include enlarging documents to make them easier to read, introducing longer or more frequent breaks, rotating jobs to relieve monotony and stress and permitting use of headphones.

Bodek noted that in Japan, it is common for companies to provide workers with two exercise breaks per day — on company time. "We have to do a couple of things here that we don't do in the U.S.," he said.

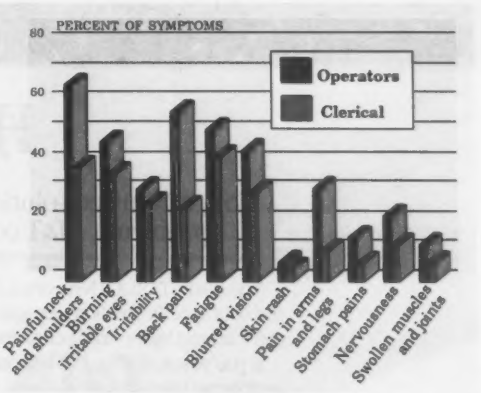
About 65% of the managers said that in the past year they have introduced new ergonomic equipment, such as adjustable foot rests, antiglare screens, document holders and desk lamps for dark corners.

Of the managers who introduced new work procedures,

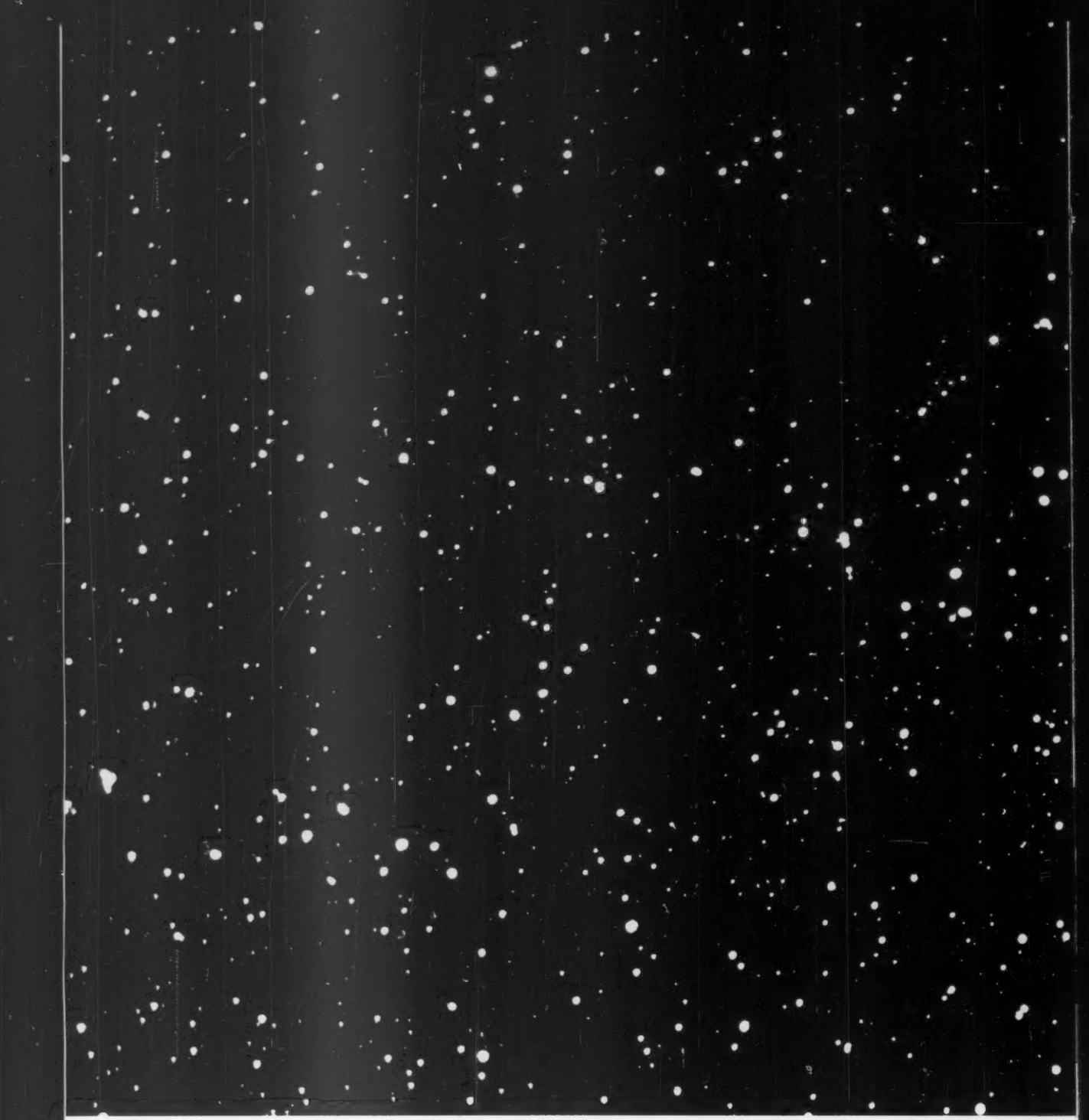
Continued on page 92

Data entry disorders

Symptoms reported by data entry operators vs. those of clerical workers in the same departments



INFORMATION PROVIDED BY DATA ENTRY MANAGEMENT ASSOCIATION
CW CHART



How many possibilities are there

For customized solutions to networking problems, AT&T comes through.

The AT&T STARLAN Network is so flexible, you can tailor it to suit your specific needs, to get your people sharing information, software and high-priced peripherals.

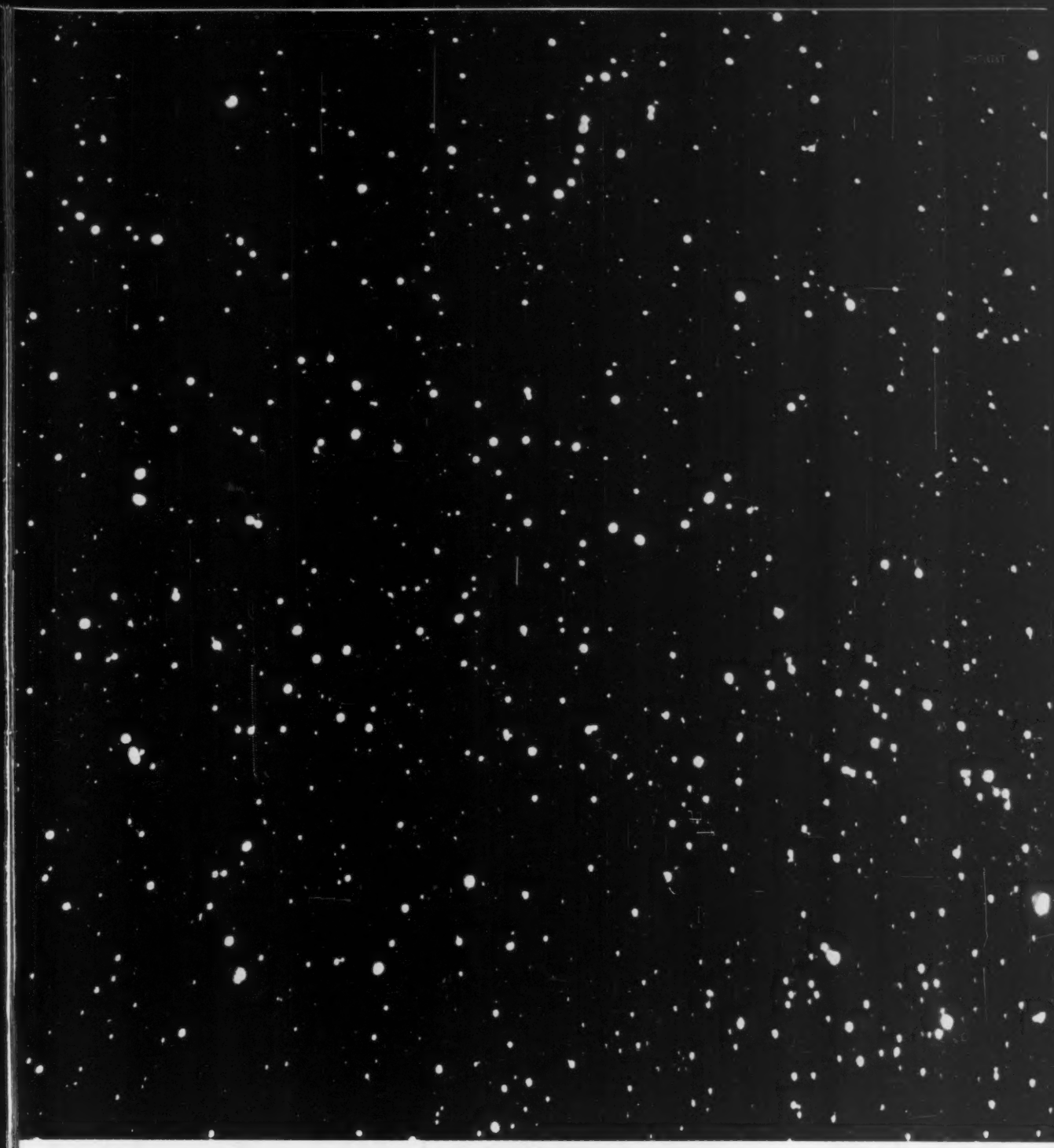
If you've got just two PCs and one printer, or more PCs and peripherals than you care to count, you can easily link all of them together with the STARLAN Network using standard telephone wiring.

AT&T's STARLAN Network is so compatible it works with PCs and software made by different manufacturers. Even MS*-DOS and AT&T's UNIX® System V workstations are able to share information and resources, giving users easy access to one another's files.

As many as ten computers can be linked together in a basic Daisy Chain configuration. And there's no expensive central equipment to buy, so your start-up costs are kept to a minimum.

When you're ready to expand, the STARLAN Network's modular design makes it simple. With Network Extension Units, you can add on over one hundred users spread across an entire department or small business. Even your departmental

*Trademark of Microsoft Corporation



with AT&T's STARLAN Network?

STARLAN Networks can be linked by connecting them to AT&T's powerful Information Systems Network, giving you a fully integrated system with PCs, mainframes and terminals.

The STARLAN Network also offers AT&T service and support, including installation, documentation, maintenance, training and hotline assistance.

From equipment to networking, from computers to communications, AT&T comes through. To find out how to take your first step toward a flexible networking solution, contact your AT&T Account Executive, your authorized AT&T supplier, or call 1 800 247-1212.

AT&T
The right choice.

Keep up

FROM PAGE 89

businesses can find ways to use computers to gain a competitive edge.

The problem is the sense of inferiority that these articles create. It's fun to read about the 1% on the leading edge of anything, be it throwing a football or computerizing a business, and it has always been so. There's nothing wrong with this as long as we keep it in perspective.

Keeping the right perspective isn't always easy. Most MIS directors can read about Chicago Bears quarterback Doug Flutie without saying, "Gee, I oughta be on that field, too." We know we don't have the talent. We know throwing footballs isn't expected of us. But most strategic systems articles have a nagging "should." We should floss every day, we should eat green vegetables, we should develop strategic systems.

Part of a healthy perspective is to remember we are reading about the leading edge. Most DP shops are still trying to get their on-line applications to work with the new data base — if they are that far along. There are personal computers on perhaps 25% of the desks where they could be used productively. Almost no one has departmental systems fully in place today.

Electric pizza?

In November 1986, I took an informal survey of 35 firms, and only 20% even had a departmental system strategy. We are not necessarily incompetent, lazy or stupid just because we haven't implemented electronic pizza ordering. (I can hear a synthesized voice telling me to press one for pepperoni, two for onion, three for mushroom.)

That much is essential for our self-respect. And it's legitimate. Readers can show this column to their boss the next time the question, "How come we don't have a strategic system?" comes booming from the corner office. But it's not the whole story.

The second part of the perspective is essential to the future of our employers. The leading 1% show the rest of us where we must aim. By way of an analogy, flying across the Atlantic Ocean in 1930 was something one read about in the headlines. By 1950, most top business executives had done it. By 1970, most of our neighbors had done it.

The pace of change has accelerated — and nowhere faster than in computers. The leading 1% are important to watch because in them, we see ourselves a precious few years down the road. The trick is to keep on top of today's pressures while laying the groundwork for the strategic system of tomorrow. That is the responsibility of every top functional executive. The MIS chief is no exception.

One step MIS executives can take is to ask why some potential customers do not choose their firm as a supplier. Then they can ask what information-related improvements might change the prospects' minds. A brainstorming session, perhaps with non-MIS people as well, should provide dozens of possibilities. Most will probably relate to inventory, since customers see it directly. Airline reservation systems, for example, are inventory management systems.

Sorting suggestions

The next step is to narrow the list to a few practical suggestions. Work on these doesn't have to start the next day. After all, there are on-line applications and the data base management system to integrate. But the sooner MIS executives can identify what they want to do in the future, the better their staff can put in the necessary hooks and handles today.

As new systems are implemented in the normal course of MIS operations, strategic aspects can be built into them.

An MIS operation is not necessarily second-class simply because it doesn't have a strategic system. But it will quickly become second-class if its top managers aren't at least thinking about strategic systems and planning for their eventual arrival. Most competitive businesses can find ways to use computers to gain a competitive edge. In fact, they must. If they don't, their competitors will — and then where will the laggards be?

Mallach is associate professor of computer science at the Boston College School of Management.

VDT ailments

FROM PAGE 89

47% said the changes were very successful and 53% said they were moderately successful. Of those who introduced new equipment, 34% said the moves were very successful and 65% said they were moderately successful.

"The data entry environment is not really designed for people — it's designed for equipment, and the people get slotted in. So the job itself can become very repetitive and boring. If management can inspire people to be more creative, a lot of that stress would change," Bodek said.

A total of 514 operators and clerical employees from 31 data processing operations responded to the survey.

One manager at each operation distributed the survey and collected the results.

Of the managers surveyed, nearly 68% said VDTs are safe, none said they are unsafe and 32% said they don't know.

Survey recommended

Bodek recommended that managers conduct such a survey in their shops and use the results to seek help from upper management in addressing health complaints.

Bodek said some changes in equipment or procedure can be introduced quickly — such as low-glare light bulbs, ergonomic chairs, greater space between desks and effective ventilation, especially where there is chemical odor or cigarette smoke.

Bodek also strongly recommended that managers encourage all employees to make suggestions for improving work processes.

$500,000
Venture Capital
available for the marketing or development of software products that run under MVS or VM.
Please write or call Peter J. McLaughlin at
(312) 525-6400
ChicagoSoft
738 N. LaSalle St., Suite 2
Chicago, IL 60610

UPS from Cyberex

Trusted by industry for years. Specified for EDP today!
For total power protection of your electronic data processing operations, specify Cyberex Uninterruptible Power Systems. You can have confidence in our 18 years of experience with thousands of highly reliable systems installed worldwide. Available 1 KVA to Megawatts.
CYBEREX
Learn how Cyberex can provide the right system for your critical application.
Call 1-800-631-1236
7171 Industrial Park Blvd. • Mentor, OH 44060
(216) 946-1783

DEC
BROOKVALE ASSOCIATES...Our 13th Year
Quality Used Systems Integration You Can Depend On

Founding Member
ddb Digital Dealers Association
RENT • BUY • TRADE • SELL
YOUR BEST SOURCE FOR VAX® & PDP-11® PRODUCTS
WEST COAST: 800-252-6200
206-392-9878
EAST COAST: 800-645-1167
516-273-7777
FAX: 206-391-2384 • TELEX: 4973833 • FAX: 516-273-7648
DEC, VAX & PDP-11 are registered trademarks of Digital Equipment Corp

LU 6.2
It's a Jungle.
Building software to interface with LU 6.2 takes more than a programmer. It takes a seasoned pro who's been there and back.
Let DPS be *your* Guide.
REQUIREMENTS
DESIGN
IMPLEMENTATION
TROUBLE SHOOTING
Diversified Programming Services, Inc.
dPs
(415) 333-6200
136 Everson Street
San Francisco, CA 94131

COMPUTERWORLD. It's indispensable!

Please enter my subscription to COMPUTERWORLD at the low Special Introductory Rate of just *$38.95 for 51 issues, a savings of $5 off the basic rate! Plus, I'll receive all 12 COMPUTERWORLD FOCUS issues at no extra charge.

☐ Bill me. ☐ Payment enclosed. Address Shown: ☐ Home ☐ Business

FIRST NAME M.I. LAST NAME

*U.S. only.

TITLE

COMPANY

ADDRESS

CITY STATE ZIP

1. BUSINESS/INDUSTRY (Circle one)
10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government—State/Federal/Local
65. Public Utility/Communications Systems/ Transportation
70. Mining/Construction/Petroleum/ Refining/Agriculture
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Computer Service Bureau/Software/ Planning/Consulting
90. Computer/Peripheral Dealer/Distributor/Retailer
75. User: Other _____
95. Vendor: Other _____
(Please specify)

2. TITLE/FUNCTION (Circle one)
IS/MIS/DP MANAGEMENT
19. Vice President, Asst. VP
21. Dir., Mgr., Supv., IS/MIS/DP Services
22. Dir., Mgr., Supv., of Operations, Planning, Adm. Services
23. Dir., Mgr., Supv., Analyst, of Systems
31. Dir., Mgr., Supv., of Programming
32. Programmer, Methods Analyst
35. Dir., Mgr., Supv., OA/WP
38. Data Comm. Network/Systems Mgt.
OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgr.
12. Vice President/Asst. VP
13. Treasurer, Controller, Financial Officer
ENGINEERING
41. Engineering, Scientific, R & D, Tech. Mgt.
SALES
51. Manufacturing Sales Reps., Sales/Mrktg. Mgt.
OTHER PROFESSIONALS
60. Consulting Mgt.
70. Medical, Legal, Accounting Mgt.
80. Educators, Journalist, Librarians, Students
90. Others _____
(Please specify)

3. COMPUTER INVOLVEMENT (Circle all that apply)
Types of equipment with which you are personally involved either as a user, vendor, or consultant.
A. Mainframes/Supermins
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems
F. No Computer Involvement

3313-CA

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES
BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 SOUTHEASTERN, PA 19398
POSTAGE WILL BE PAID BY ADDRESSEE
COMPUTERWORLD
CIRCULATION DEPARTMENT
BOX 1016
SOUTHEASTERN, PA 19398-9984

Nabisco

CONTINUED FROM PAGE 89

mation systems continue to serve the changing needs of the company."

Nabisco says it plans to continue using hundreds of custom-built application programs that now run under a variety of nonrelational DBMS structures. In the coming months and years, a host of older products, including IMS and IDMS, will gradually be replaced.

The data now under the IMS and IDMS data file structures will be moved to those of Cincom Systems, Inc.'s Supra and Ultra relational DBMSs, Brout says. In March, RJR Nabisco signed a three-year contract with Cincom under which Cincom will provide RJR Nabisco with its IBM-compatible Supra and Digital Equipment Corp. VAX-compatible Ultrasystems.

Nabisco decided to move to the Cincom systems after a nine-month search by an MIS task force to identify a single relational DBMS technology for the company. IBM's DB2 was considered but not chosen because the Nabisco task force felt that as of late 1986, DB2 was not as full-featured as Supra. "We have concluded that Cincom's product is significantly ahead of DB2, both in terms of its delivery of the relational model and in terms of its referential integrity," Brout says.

Nabisco's MIS managers have also decided to discontinue use of On-Line Software International, Inc.'s Ramis fourth-generation language. Instead, most new applications will be written in Cincom's Mantis fourth-generation language, Brout says.

Applications generated by Mantis can run in conjunction with both Supra and Ultra with only a few minor changes. This is an important feature for Nabisco, which is increasing the use of VAXs in its U.S. operations.

Eventually, Brout says, Nabisco may try to leverage its existing network between the San Francisco, Wilkes-Barre and Winston-Salem mainframe centers into a way to provide a single-system view of the corporate data base.

Sohio

CONTINUED FROM PAGE 89

Credit for the personnel cuts goes primarily to the center's continuing emphasis on systems integration. "When you connect a workstation to a mainframe, for example, one person can do the same amount of work that would otherwise require multiple employees," Bone says.

During the past two years, Sohio has also trimmed the technical DP site's total support costs, including electricity and cooling bills, by an estimated 10% to 15%. "Any time you integrate systems, you can reduce the number of processors you have in-house and thus decrease your utility and maintenance overhead," Bone says. "Integration affects all areas," he adds, including floor-space costs, as organizations increase their computing capacity per square foot.

Since its formation more than five years ago, Sohio's technical data center has served as the hub of an engineering and scientific computing network that encompasses nodes in Anchorage, Alaska, Cleveland, Houston, New York and San Francisco.

The center is also linked with the London headquarters of the company's parent firm, British Petroleum Co.

In support of Sohio's key technical disciplines, the installation performs at least two major categories of scientific and engineering applications. One is seismic information processing, which aids oil companies in locating untapped deposits. The other is reservoir modeling, which uses an oil field's current attributes to predict changes in its production capacity as it ages.

Both kinds of applications entail large volumes of vector processing, for which the technical data center provides two Cray Research, Inc. XMP-2s. Seismic sensing and reservoir modeling also necessitate a great deal of background and low-end scalar processing.

For the background jobs, the center contains a host of Digital Equipment Corp. VAX-11/785s and a VAX 8800. For low-end computing jobs, the center depends mainly on VAX-11/780s.

At A Glance

RJR Nabisco, Inc.

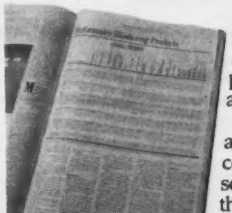
RJR Nabisco: Ranked 14th in the Fortune 500
1986 revenue: $16.9 billion
Assets: $17 billion
Employees: 124,000

Data centers at year-end 1986: Winston-Salem, N.C. — Four IBM 3090 Model 400s; San Francisco — IBM 3090 Model 200, IBM 3083; Wilkes-Barre, Pa., headquarters — IBM 3090 Model 400, Model 200

Wilkes-Barre facility replaces current computer room in East Hanover, N.J., which currently has an IBM 3090 Model 200 and an IBM 3084

INFORMATION PROVIDED BY RJR NABISCO, INC.

In SPOTLIGHT, the buyer's guide to the computer world.



Inside *Computerworld* these days, you'll find something new. SPOTLIGHT. Each one a special "buyer's guide" covering features, prices and specs for every major offering in a given product category.

For our readers, SPOTLIGHT provides a unique feature-by-feature tabulated product comparison in a handy pullout section. A section they'll save for quick reference when they're ready to buy. Plus editorial covering technology trends, user reports and broad category overviews.

For our advertisers, it provides an opportunity to strike while the iron is hot. And reinforce sales messages at precisely the right moment. Just as buying decisions are being made.

So reserve your space in SPOTLIGHT now. And get your message across when it will do the most good. When the buyers are buying.

For more information, contact Ed Marecki, Vice President/Sales at (617) 879-0700, or call your local *Computerworld* sales representative.

Upcoming SPOTLIGHT Issues

Issue	Ad Closing Date
May 11*	April 24
May 25	May 8
June 8*	May 22
June 22	June 5
July 6	June 19
July 20	July 3

*Starch Ad Study Issue

Sales Offices:
Boston: (617) 879-0700
New York: (201) 967-1350
Washington D.C.: (703) 280-2027
Atlanta: (404) 394-0758
Chicago: (312) 827-4433
Dallas: (214) 233-0882
Los Angeles: (714) 261-1230
San Francisco: (415) 421-7330

COMPUTERWORLD

CALENDAR

MAY 24-30

Icographics '87: Second International Conference and Exhibition on Computer Graphics. Milan, Italy, May 26-29 — Contact: World Computer Graphics Association, Inc., Suite 399, 2033 M St. N.W., Washington, D.C. 20036.

Workshops on Computer-Assisted Map Analysis. New Haven, Conn., May 27-28 — Contact: Joseph K. Berry, School of Forestry and Environmental Studies, Yale University, 205 Prospect St., New Haven, Conn. 06511. Also being held June 9-10 in Tucson, Ariz.; June 17-18 in Athens, Ga.; Sept. 16-17 in Corvallis, Ore.; and Oct. 24-25 in Berkeley, Calif.

SIGMOD '87 International Conference on Management of Data. San Francisco, May 27-29 — Contact: Association for Computing Machinery, 11 W. 42nd St., New York, N.Y. 10036.

Computer and Network Security '87. Washington, D.C., May 27-29 — Contact: Institute for International Research, Inc., Suite 1212, 310 Madison Ave., New York, N.Y. 10017.

CASE '87. First International Workshop on Computer-Aided Software Engineering. Cambridge, Mass., May 27-29 — Contact: Elliot Chikofsky, Index Technology Corp., One Main St., Cambridge, Mass. 02142.

1987 Information Management Conference. Toronto, May 27-29 — Contact: John Hobbs, Data Base Association (Ontario), Inc., P.O. Box 5639, Station A, Toronto, Ont., Canada M5W 1N8.

California Computer & Graphics Show. Palo Alto, Calif., May 28 — Contact: Norm De Nardi Enterprises, Suite 204, 289 S. San Antonio Road, Los Altos, Calif. 94022.

Productivity: A Path to Peak Performance, the Seventh Annual Information Processing Seminar. St. Charles, Ill., May 28-29 — Contact: Arthur Andersen & Co., 69 W. Washington St., Chicago, Ill. 60602.

Clinical Information Systems Management: The Crucial Differences. Atlanta, May 28-29 — Contact: Vicki Hall, HBO & Co., 301 Perimeter Center N., Atlanta, Ga. 30046.

Association for Computing Machinery Professional Development Seminars. Boston, May 30 — Contact: Gerry Hayes, Cullinane Hall 161CN, College of Computer Science, Northeastern University, 360 Huntington Ave., Boston, Mass. 02115.

MAY 31-JUNE 6

Banklink 1987 Users Conference. Nashville, May 31-June 3 — Contact: Banklink, Inc., 12th Floor, 380 Madison Ave., New York, N.Y. 10017.

ABA National Operations and Automation Conference. San Francisco, May 31-June 3 — Contact: American Bankers Association, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

ISDN '87: Symposium on Integrated Services in Digital Networks for Telecommunications. Monterey, Calif., May 31-June 4 — Contact: Russ deWitt, Contel Service Corp., 245 Perimeter Center Pkwy., Atlanta, Ga. 30346.

Fuse '87, The National Focus Users Meeting. Palm Desert, Calif., May 31-June 5 — Contact: Fuse, Inc., Suite 4302, 450 7th Ave., New York, N.Y. 10123.

Computer Law Update. June 1-2 — Contact: Barbara Fieser, Suite 210, 8303 Arlington Blvd., Fairfax, Va. 22031.

AICPA 1987 Microcomputer Conference & Exhibition. Dallas, June 1-3 — Contact: Continuing Professional Education Division, American Institute of Certified Public Accountants, 1211 Avenue of the Americas, New York, N.Y. 10036

Seventh Annual Conference of the Association of Human Resource Systems Professionals. Minneapolis, June 1-3 — Contact: Susan G. Goldenberg, HRSP, Inc., P.O. Box 8040-A202, Walnut Creek, Calif. 94596.

Take the Lead in Data Capture. Los Angeles, June 1-3 — Contact: Data Entry Management Association, P.O. Box 16711, Stamford, Conn. 06905.

Second Guelph Symposium on Computer Conferencing. Guelph, Ont., June 1-4 — Contact: Division of Continuing Education, Room 160, Johnston Hall, University of Guelph, Guelph, Ont., Canada N1G 2WI.

Seventh Annual Comdex/Spring '87. Atlanta, June 1-4 — Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

EFOC/LAN 87 — The 5th European Fibre Optic Communications and Local Area Networks Conference, Educational Program and Exhibition. Basel, Switzerland, June 1-5 — Contact: IGI Europe, Inc., Suite 200, 214 Harvard Ave., Boston, Mass. 02134.

Distributed Processing: Leveraging Architectures, Applications and the Organization. New York, June 2-3 — Contact: William Smulsky, Seminar Division, The Yankee Group, 200 Portland St., Boston, Mass. 02114.

NTT International Symposium 87. Tokyo, June 2-3 — Contact: Nippon Telegraph and Telephone Corp.'s International Symposium 87, c/o International Public Relations Co., Shinbashi Fuji Bldg., 2-1-3 Shinbashi, Minato-ku, Tokyo 105, Japan.

10th Annual Contemporary Copyright and Proprietary Rights Issues Institute. Washington, D.C., June 3-4 — Contact: Stephen Glasser, Prentice-Hall Law & Business, 855 Valley Road, Clifton, N.J. 07013.

AI/Europa '87. Frankfurt, West Germany, June 3-5 — Contact: TCM Expositions, Ltd., 331 W. Wesley St., Wheaton, Ill. 60187.

JUNE 7-13

Annual Disc, Inc. Users Conference. New Orleans, June 7-10 — Contact: Gerald J. Markowitz, Disc, Inc., 1314 Bedford Ave., Baltimore, Md. 21208.

Bar Coding Seminar Series. Atlanta, June 8-9 — Contact: Automatic Identification Manufacturers, Inc., 1326 Freeport Road, Pittsburgh, Pa. 15238.

Psychometrics Inc.

PRESENTS

two new additions to the Berger Series of DP Personnel Tests

SYSPRO

A job-related test that will identify proficient MVS systems programmers

B-WORD

A job-related test that measures aptitude for word processing on any equipment

For information, write or call:

Psychometrics Inc.
13245 Riverside Drive
Sherman Oaks, CA 91423- 2172

(818) 783-5731

publishers of aptitude and proficiency tests for programmers, systems analysts, and computer operators.

STUCK, AREN'T YOU?

Stuck with RPG II applications running only on IBM machines?

Language Processors, Inc., an innovator in compiler technology, has your solution: an RPG II compiler that rescues your applications from these aging machines.

LPI-RPG II allows you to retain your present RPG II investment by letting you port the applications to just about any UNIX or XENIX-based computer.

The applications will run fast because LPI-RPG II is a true compiler that produces fast and compact machine code. You can continue to extend your applications because LPI-RPG II gives you a complete development environment. And display screen formats are exactly the ones you are used to.

LPI-RPG II is just one of an entire family of compilers. The LPI family allows you to develop every subprogram of an application in the LPI language best suited for the job, and then execute cross-language calls between the subprograms. You choose the language – we will supply the compiler – with the support that made us stand above the crowd.

Copyright 1987 by Language Processors, Inc. LPI and LPI Logo are trademarks of Language Processors, Inc. The companies mentioned above own numerous registered trademarks.

And next time you buy a computer, you won't be stuck – LPI languages will be on it.

LPI-RPG II is IBM System/3, System/34 and System/36 compatible. It is accompanied by an OCL processor and a broad set of utilities: SORT, SEU, DFU, JOBQ, MENU, MSGBLD, SFGR, and /COPY. LPIPPG will convert data files from EBCDIC to ASCII. WORKSTN file support is provided.

Available on MC680X0-based computers, such as Altos, Arete, AT&T, CT, NCR, Sun and Unisys.
NEW: on AT&T 3B2, 3B5 and 3B15 Series computers.
NEW: on Intel 80386-based computers.

Call the LPI Retail Group now to order, or send the coupon. Prices start at $995 for 80386 machines.

I need more information on LPI-RPG II for the following computers:

I need more information on your other language(s):

Name — Title (or attach your business card)

Address — Phone

LPI
The Language Source

Language Processors, Inc.
400-1 Totten Pond Road
Waltham, MA 02154
Telephone: 617-890-1155
Telefax: 617-890-5633
Telex: 951-671

LPI: RPG II, PL/I, COBOL, BASIC, FORTRAN, PASCAL, C, DEBUG

COMPUTER INDUSTRY

INDUSTRY INSIGHT

Clinton Wilder

Doin' the CEO shuffle

Changes at the top levels of the executive ladder can mean very different things for different companies. Often, the change that appears to be the most historic or significant is merely a formality to signify a transition that has already taken place. In the major executive changes that the computer industry has seen in the past few weeks, several familiar scenarios have been played out, including the following:

The attempted coup. There was speculation in this column recently about the chances for Tom Rattigan to duplicate the success of a fellow former Pepsico, Inc. executive, John Sculley, and turn Commodore Business Machines into a prominent vendor of microcomputers to U.S. business as well as the home market.

What has happened at Commodore since then is eerily reminiscent of the tumultuous summer of 1985 at Apple Computer, Inc. — with a very different result.

While Commodore was introducing its Amiga 2000 in both Hannover, West Germany, and Boston in March, a management battle straight out of the prime time TV soaps was brewing between Rattigan and controversial Commodore Chairman Irving Gould. Some reports have it that Rattigan was marshaling board members against Gould in an attempt to gain control of the company, which truly would have recreated the Sculley-Steve Jobs scenario at Apple.

Whatever was really going on, Gould felt sufficiently challenged to give Rattigan the ax. Neither Commodore nor Ratigan has much to say on the topic — Rattigan, in fact, is letting his multimillion-dollar lawsuit do the talking. Who will ultimately win is anyone's guess, but it is already clear who, or what, has lost the most: Commodore. For a company trying to reposition itself as a dependable vendor of

Continued on page 101

Setting software world afire

Computer Associates first software firm to clear $100M-quarter hurdle

BY ALAN ALPER
CW STAFF

GARDEN CITY, N.Y. — Reaping the benefits of an aggressive acquisition campaign and a strong internal development effort, Computer Associates International, Inc. last week became the first independent software concern to crack the $100 million quarterly revenue mark.

For the fourth quarter, which ended March 31, the firm reported revenue of $102 million, a 77% increase from the comparable period last year.

Net income in the fourth quarter rose 111% to $11.2 million, or 23 cents per share, Computer Associates said.

Computer Associates posted fiscal 1987 revenue of $309.3 million, up 62% from last year. Net income rose 97% to $36.4 million, or 74 cents per share. Per share earnings reflect a two-for-one stock split completed May 7.

Performs well in all areas

Belden Frease, senior vice-president and secretary at Computer Associates, said the firm performed well in all of its business segments from microcomputer applications through IBM mainframe systems software.

"We attained our goals across the board," he said. "No one particular segment of our business did unbelievably fantastic."

The results, which exceeded analysts' expectations, temporarily place Computer Associates as the largest independent software concern, the firm noted.

"That's true until Lotus [Development Corp.] or Microsoft [Corp.] report their June quarter," noted Charles Taylor Jr., analyst at Prudential Bache-Securities, Inc. in New York.

Computer Associates went on a buying spree last year that helped it to diversify an already broad assemblage of products. Among its acquisitions, the firm

Continued on page 100

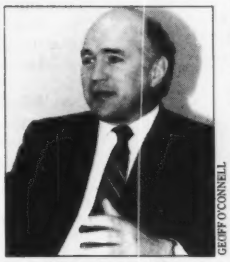
UPDATE

Thunder from down under

BY GLENN RIFKIN
CW STAFF

He has killed no crocodiles in the outback, and his adventures nowadays are confined to steering Wang Laboratories, Inc. through the shark-infested waters of the computer industry. But Ian Diery (as in "fiery") clearly brings to mind that Australian water-walker Crocodile Dundee.

The native Australian, Wang's recently appointed senior vice-president of U.S. operations, is already growing to heroic proportions in the minds of Wang's employees. Their hope is that he'll soon be able to give the word: "No worries, mates."



GEOFF O'CONNELL

Wang's Ian Diery

Unfortunately, Diery and those who follow Wang know that plenty of worries still remain. The company's recent profitable quarter — its first in the last three quarters — gives rise to some optimism, especially in light of the past 18 months of losses and layoffs. But Wang still faces innumerable challenges to regain its luster, and new President Fred Wang will have to lean heavily on Diery to help engineer the turnaround, consultants say.

"Diery is a straight-ahead problem-solving character, and he's not going to get caught up in Wang's internal politics," comments consultant George Colony, president of Forrester Research, Inc. in Cambridge, Mass.

Continued on page 98

M/A-Com sells Mtel to Hughes

BY ALAN J. RYAN
CW STAFF

BURLINGTON, Mass. — M/A-Com, Inc. announced last week that it has reached an agreement in principle for the sale of its M/A-Com Telecommunications Division (Mtel) to Hughes Aircraft Co., a subsidiary of General Motors Corp.'s Hughes Electronics Corp. unit.

Mtel supplies equipment and systems for commercial satellite and terrestrial communications, including very small-aperture terminal earth stations, packet-switching network products and data-switching products for use by telephone companies.

Mtel operations are based in Germantown, Md., and San Diego.

Some industry watchers said last week that the deal will be in the $110 million range, but "that is strictly speculative on the part of Wall Street analysts," said Joseph C. Bothwell Jr., M/A-Com senior vice-president for corporate development. He would not disclose any dollar amount on the deal.

Bothwell said the division's revenue exceeded $100 million last year.

Inside

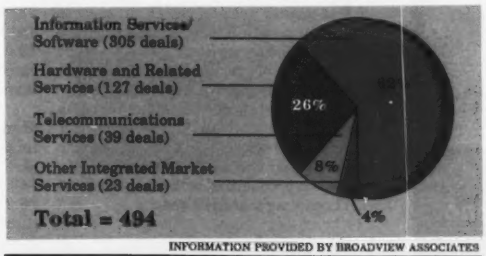
- Aldus registers with SEC for initial public offering. Page 96.
- Tandem pens Coopers & Lybrand into lineup as "solutions implementor." Page 100.

Wang to help bankroll U.S.-Taiwan joint ventures. Page 101.

Data View

Mergers and acquisitions, 1986

The total of computer industry deals was 50% higher than in 1985



INFORMATION PROVIDED BY BROADVIEW ASSOCIATES

CBEMA seeks louder voice in future U.S. trade actions

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Computer companies, feeling burned by two recent episodes in U.S.-Japan trade relations, recently proposed legislation that would force the U.S. government to consider the effects of trade agreements and sanctions on the industry.

The so-called "user amendments" to U.S. trade laws were drafted by the Computer and Business Equipment Manufacturers Association (CBEMA). The proposals would force the government to consult with, and grant exemptions to, industries that could be hurt by future trade actions.

CBEMA spokeswoman Charlotte LeGates said the computer industry "found itself in the line

Continued on page 100

AT&T taps Korean firm for VLSI chips

SEOUL, South Korea — Goldstar Semiconductor Ltd., which AT&T owns 44% of, will most likely become the U.S. telecommunications giant's Korean supplier of semiconductor products, South Korean sources said.

Sources said Goldstar and AT&T are negotiating a project whereby AT&T would be supplied by its Korean partner with very large-scale integrated (VLSI) chips, such as 256K-byte dynamic random-access memory (RAM) and 1M-byte dynamic RAM products, while reducing its U.S. chip production.

According to industry sources, AT&T was originally reluctant to use Korea as a supplier, fearing that local producers lacked VLSI expertise. But AT&T's fears have reportedly been allayed by successful test trials.

If the agreement is signed, Goldstar will need to expand its existing production lines to support mass production of the 256K-byte and 1M-byte dynamic RAM chips, and AT&T will transfer its VLSI technologies to Goldstar.

This story was reported by Computerworld Korea, *IDG Communications' South Korean newspaper.*

Aldus files for stock offering

Hopes for sale of two million shares of common stock

BY ALAN J. RYAN
CW STAFF

SEATTLE — Aldus Corp., a developer of desktop publishing software for the Apple Computer, Inc. Macintosh and the IBM Personal Computer AT and compatible microcomputers, has filed a registration statement with the Securities and Exchange Commission for a proposed initial public offering of approximately two million shares of its common stock.

Under the proposal, 1,350,000 shares will be sold by the company and 690,000 by the selling shareholders.

The expected price for the common stock is $14 to $16 per share, according to the preliminary prospectus, which was dated May 4.

The company will have approximately 10,300,000 shares outstanding after the offering.

Firms to co-manage

The prospectus was filed by Alex Brown & Sons, Inc. in Baltimore and Montgomery Securities in San Francisco, the two investment banking firms that will co-manage the offering.

Currently, Aldus is not negotiating nor planning any acquisitions, according to the prospectus. Aldus also may use a portion of the proceeds to acquire or lease additional or new facilities. Pending such uses, the company reportedly will invest the net proceeds in income-producing securities.

The company employs 193 people, including 40 in product development and management; 103 in sales, marketing and support; 22 in manufacturing and distribution; and 28 in finance and administration.

Aldus President and Chief Executive Officer Paul Brainerd, 39, a former vice-president of Atex, Inc., founded Aldus in 1984.

The company's main software product, Pagemaker, began shipping in July 1985.

NICKELS & DIMES

Intellicorp announced net income for the third quarter ended March 31 of $69,000, or 1 cent per share, compared with $609,000, or 8 cents per share, last year.

Revenue was $5.5 million, compared with $5.4 million a year ago.

NBI, Inc. reported a net loss of $933,000, or 11 cents per share, on revenue of $69.2 million for the third quarter ended March 31. This compares with a net loss of $2.4 million, or 25 cents per share, on revenue of $67.6 million for the comparable period last year.

TIE/Communications, Inc. announced revenue for the first quarter ended March 31 of $63.2 million, compared with $82.8 million last year. The company reported a net loss of $1.1 million, or 3 cents per share, compared with $2.6 million, or 7 cents per share, last year.

Gould, Inc. announced net income for the first quarter ended March 31 of $5.6 million, or 13 cents per share, compared with net income of $14.5 million, or 32 cents per share, in the previous year. Revenue was $227.6 million, compared with $228.3 million last year.

Masstor Systems Corp. announced revenue for the first quarter ended March 31 of $9.4 million, compared with $4.9 million last year. Profits were $304,000, or 2 cents per share, compared with a loss of $2.1 million, or 13 cents per share, in the comparable period a year ago.

Alloy Computer Products, Inc. reported revenue for the first quarter ended March 31 of $10.8 million, compared with $10 million in the previous year. Profits were $785,000, or 17 cents per share, compared with $640,000, or 17 cents per share, in the like quarter last year.

Fibronics International, Inc. announced revenue for the first quarter ended March 31 of $8.8 million, compared with $7.2 million in the previous year. Profits were $164,090, or 3 cents per share, compared with $106,529, or 2 cents per share, last year.

Ing. C. Olivetti & Co. announced that strong growth in European sales pushed the company's annual group revenue up 19% in 1986 to $5.7 billion. Net profits rose 12% from the previous year's level to $440 million. European sales accounted for 73% of the firm's total revenue.

N. V. Philips reported a 42% rise in first-quarter net profits to $101 million, compared with $71.3 million during the year-earlier period.

Network Systems Corp. reported revenue for the first quarter ended March 31 of $20.3 million, down 15% from last year's $24 million level. Net income for the quarter was $1.1 million, or 4 cents per share, compared with $3.1 million, or 11 cents per share, last year.

Interleaf, Inc.'s net income for the fourth quarter ended March 31 increased 149% to $642,000 from $258,000 a year earlier. Revenue increased 74% to $11.8 million from $6.8 million for the same period last year.

Full-year revenue doubled to $37.2 million, while the fiscal 1987 loss dropped to $410,000 from $2.4 million.

Comsat Corp. announced revenue for the quarter ended March 31 of $123.3 million, compared with $114.9 million last year. Profits were $8.5 million, or 46 cents per share, compared with $14 million, or 76 cents per share, a year ago.

Priam Corp. announced revenue for the third quarter ended March 31 of $36.1 million, compared with $36.2 million last year. Profits were $72,000, or zero cents per share, compared with $2.5 million, or 10 cents per share, in the previous year.

Pyramid Technology Corp. reported revenue for the second quarter ended March 27 of $12.6 million, compared with $11.1 million in the previous year.

Profits were $426,000, or 5 cents per share, compared with $863,000, or 10 cents per share, in the like period last year.

Gateway Communications, Inc. reported net income of $653,561, or 14 cents per share, on revenue of $4.1 million. This compares with net income of $251,955, or 6 cents per share, on revenue of $2.2 million for the comparable period last year.

Cypress Semiconductor Corp. reported revenue for the first quarter ended March 30 of $15 million, compared with $9.7 million a year ago. Profits were $1.9 million, or 6 cents per share, compared with $1.1 million, or 4 cents per share, in the previous year.

Silicon Graphics, Inc.'s Computer Systems Division announced revenue for the third quarter ended March 31 of $22.6 million, compared with $10.5 million in the previous year. Profits were $2.9 million, or 21 cents per share, compared with $425,000, or 4 cents per share, in the like period a year ago.

Monolithic Memories, Inc. announced revenue for the second quarter ended March 15 of $52.6 million, compared with $42.7 million one year ago. Profits were $6.2 million, or 28 cents per share, compared with $1 million, or 5 cents per share, last year.

Database 2 Productivity Tools

X-2OOLS - DBA Utilities

Does your DB2 database administrator have to spend inordinate amounts of time performing frequent tasks like:

- Determining which DB2 objects will be affected when an object is DROPed?
- Determining existing DB2 object definitions, relationships, and security requirements?
- Moving DB2 objects from one status or system to another (e.g. - Test to Production)?
- Creating physical sequential data sets containing data from multiple DB2 tables?
- Propagating or Removing DB2 user security?

Extend productivity, rather than work hours. Let X-2OOLS - DBA Utilities assist in these cumbersome tasks. It can:

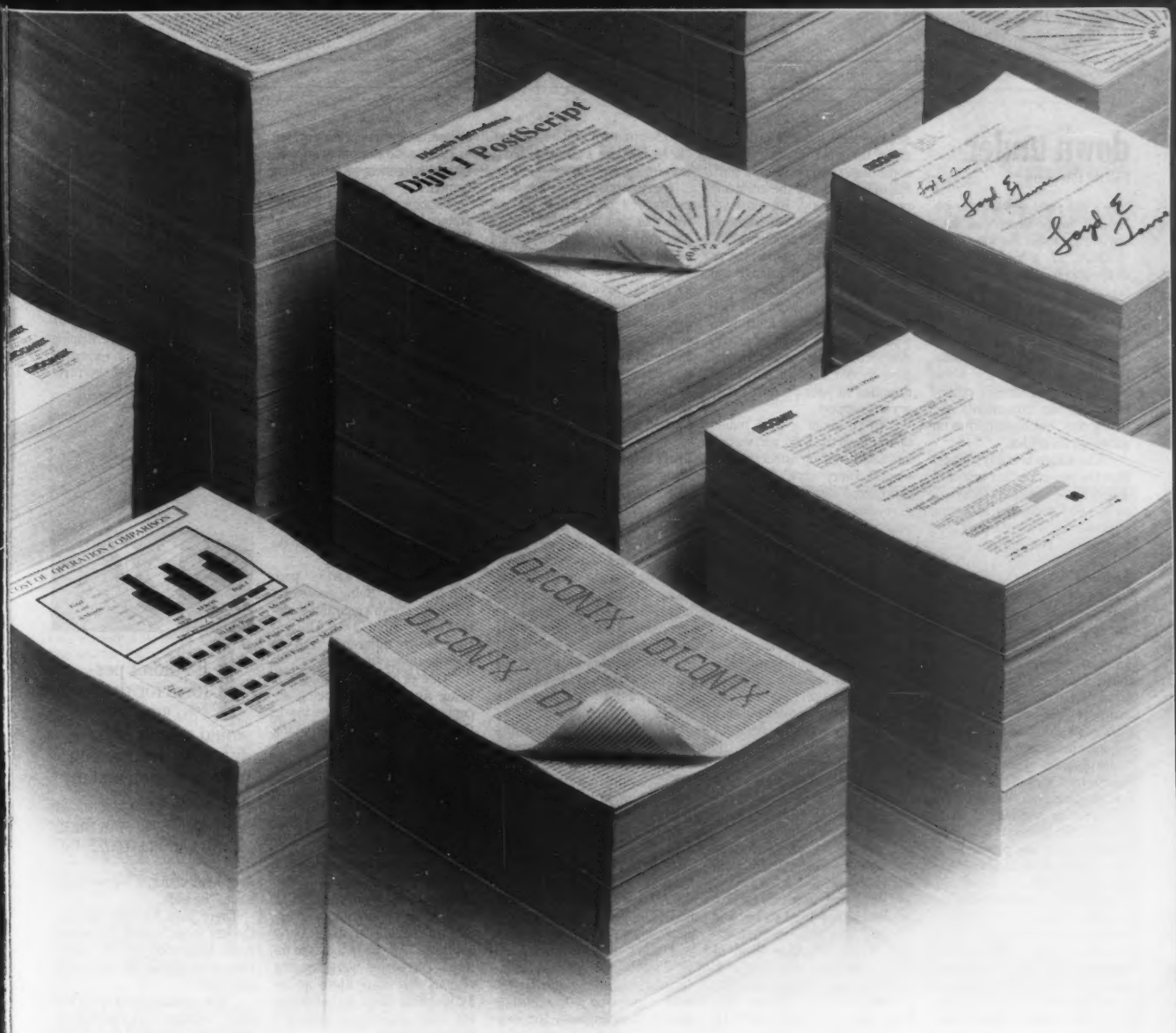
- Easily display DB2 object relationships at a terminal
- Generate SQL CREATE and/or GRANT statements for a DB2 object and optionally some or **ALL** of its related objects in a **single** operation
- Create a physical sequential data set with the data resulting from any valid SQL SELECT statement
- Generate SQL security statements to propagate/remove DB2 user security

XCI means getting results with DB2.

X-2OOLS - DBA Utilities annual licenses are $3,500.00. Annual renewal licenses are $525.00. All licenses include maintenance and enhancements. For further information contact: **800-443-7149**

XCI X-tended Computing, Inc.

1642 South Parker Road #202 ■ Denver CO 80231 ■ 303 368-0505



Get it out of your system.

Diconix brings you the very best non-impact printer in its price range: The Dijit® 1. The Dijit 1 is a real workhorse. With a duty cycle of up to 70,000 images per month, and no scheduled preventive maintenance. It prints on plain paper and transparencies, and delivers the kind of high quality, high volume throughput needed for data processing. And, it operates direct on-line through RS232/422, Centronics parallel, or through our IBM 3270 coax interface.

Cost of ownership is a mere two cents a copy. That's based on an average month's output of 50,000 images.

Duplexing in either portrait or landscape makes it easy to transition from the old fanfold paper to the new cut sheet paper in your Data Processing operation. You'll also find a more consistent black and gray fill image.

For a complete Dijit 1 demonstration and the name of the distributor nearest you, call 1-800-DICONIX.

DICONIX
A Kodak Company
3100 Research Boulevard
Dayton, Ohio 45420
1-800-DICONIX
Telex 288-280

See us at Comdex Spring, Booth 1452

Dijit is a registered trademark of Diconix, Inc.

down under

FROM PAGE 95

"He's the right guy for the job. He may not be successful, but if anyone has a shot, he does."

Diery, 37, a balding, stocky rugby player, won't ever be mistaken for "Crocodile Dundee" star Paul Hogan. Unmarried, he is, according to colleagues, a workaholic who likes his brew and does not suffer fools gladly. His aggressive style and noted impatience have already rubbed some outside consultants the wrong way, but his admirers far outweigh the critics.

"The image is always bigger than the person, either better or worse than reality," Diery insists. "All I'm doing is providing a catalyst for a lot of things that have been here already."

Resume

Diery certainly has the credentials. He used a successful sales background in Australia to land a sales job with Wang in the UK in 1978 and jumped on a fast track unparalleled in the company's history. He became a branch manager after one year, district manager a year later and country manager in just one more year.

He was the top performer in Europe each step of the way (under his direction, Wang in the UK grew to revenue of more than $100 million) and was named senior vice-president of all of Europe, Africa and the Middle East by 1985.

In 1986, while the company struggled domestically, Wang's business grew more than 33% — even higher than Digital Equipment Corp.'s — in Diery's domain.

Such growth in the U.S. will be tougher to effect. Diery must get the sales force in order and clean up what many consider some deadwood on Wang's staff. He must help get the company profitable quickly. He must address the company's distribution and field-service problems and beef up product marketing as well. He must help change the seemingly unchangeable perception of Wang as a word processing vendor. And he must help woo back a vast group of angry, disaffected Wang customers who have grown tired of unfulfilled promises in both product delivery and support.

"We're about a $1.6 billion operation in the U.S., and we had an $800 million structure in place," Diery says. "We were centralized, decisions were slow in coming, there was a lot of bureaucracy, and our people in the field just couldn't respond to the changes. So my job is not to improve the status quo but to change it."

Favorable reaction

"The reaction to Ian inside Wang has been all favorable," says Patricia Seybold, a Boston-based computer consultant. "The employees look at him as a savior; they worship him. Of course, that's expecting too much of anyone, but Wang employees need to do some hero-worshipping. Ian fills the charisma gap left by [former Wang President] John Cunningham."

Others, however, temper the enthusiasm about Diery and Wang's prospects.

"Wang may never be as successful as they used to be, and they just have to live with that," says consultant Amy Wohl of Wohl Associates in Bala Cynwyd, Pa. Forrester Research's Colony is more succinct, saying that Diery and his team have 18 months to turn things around. "If he fails, he's gone," Colony says.

Diery, whose career has been marked by fast action, agrees with that time frame. "If I didn't perform for the next two years, I would expect to have difficulty maintaining my reputation and my job," he says. "That's life.

Fred Wang, however, refuses to acknowledge that hard line. "I won't measure Ian on the profitability of the U.S. He can't do that himself. The whole company is under pressure, and he wants to fix things as much as the rest of us," Wang says.

Stuff legends are made of

Wang employees may be premature in building a pedestal for Diery, but he already has demonstrated the stuff legends are made of. He did his own "walkabout" with a year-long adventure that brought him from Australia through the treacherous highlands of New Guinea, up through Indonesia and, eventually, to Europe.

"There were lots of good stories along the way, but I'm not sure I want to tell them," he laughs.

He denies climbing the Himalayas — an internal Wang rumor — but he did survive a long night in New Guinea, having run out of gas at 4 a.m. in a dangerous part of the highlands. "Up there, nobody dies of natural causes," he says.

Diery eventually arrived in England in 1977 ("Every Australian needs to go to England to find their roots," he says) and began his stellar Wang career a year later.

While Diery's star was shining abroad, things in Lowell were growing increasingly gloomy. Cunningham, the exuberant, ambitious president, left in 1985, amid rumors of animosity and infighting with the Wang family.

Though he was not immediately named to the post, Fred Wang was the unquestioned successor. But the company ran into a wall by 1985, and its years of 40% growth rates came to a stunning halt.

An Wang, seemingly on the way to retirement, retook control. While Fred learned the ropes, such names as Carl Masi and Bob Doretti tried their hands at righting the listing ship, but to no avail.

Consultants strongly recommended that Wang bring in an outsider to set things right. But An Wang instead named Fred president in the fall of 1986, and the latter's first major move was to bring Diery across to head up U.S. operations.

Not everyone agrees with that decision. "Being successful in Europe doesn't guarantee success here," Wohl says. "The culture works differently and so does customer support."

"One of his big challenges is being Australian and being accepted as a U.S. executive inside the company," a former Wang executive says. "He's brought in a lot of his European team, and the danger there is that some people will feel he's brought in too many old pals."

Pragmatic decision

Fred Wang says that his decision was a pragmatic one. "He [Diery] went from running an $800 million operation to an operation double that size," Wang explains. "All the U.S.-based internal candidates were running regions that were more in the $200 million range, so Ian simply had more experience running a larger operation."

The blueprint for the turnaround is based on Diery's three strategic aims and six specific objectives (see sidebar).

The three strategic aims are: to reorganize and decentralize the organization; to establish the perception of Wang as a data processing provider, not just a word processing company; and to build the requisite skill levels internally to meet the requirements and sophistication of the product line and the market it serves.

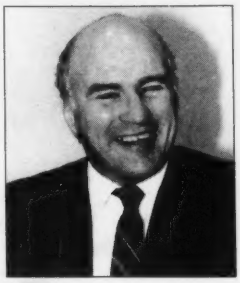
Housecleaning has already begun with a spate of departures and demotions at some of Wang's highest levels. As many as seven vice-presidents and 16 department directors reportedly have left Wang during recent months.

Also, some top-level executives such as Doretti, formerly senior vice-president of U.S. sales and marketing and now senior vice-president of corporate communications, and Ray Cullen, formerly senior vice-president of customer service and now senior vice-president/chief of staff, have been reassigned.

Diery says he is unconcerned that some egos may be bruised along the way. He has pushed various organizations together and pared down the sales management area.

"We had too much overhead in that area, and we needed better sales management," Diery states.

He says he is aware that an outsider coming in and chopping heads can produce an explosive situation. "Whenever you reduce head count, it's a sensitive issue," he adds.



"IF I didn't perform for the next two years, I would expect to have difficulty maintaining my reputation and my job. That's life."

IAN DIERY
WANG LABORATORIES, INC.

Diery says he believes that the key to unclogging the logjam is the separation of U.S. operations from within the corporate structure.

"The community of spirit has come because U.S. operations have been separated out of corporate," he states. "So my people feel much more like a team. We've worked hard to establish our identity, and it's paying off."

"We used to read about new products in computer publications or hear about them from customers," one Wang field systems consultant says. "Since Diery has been here, we hear about things internally first."

According to Marketing Vice-President Ken Olisa, Diery has quickly earned respect because the people in the field at Wang know that he has experienced virtually all levels of the business himself.

"He's aggressive, and he has great impatience when he wants something done," Olisa says, "but he's a great leader, particularly to sales and marketing people, because he has been there. He's quick to share the credit and the blame and makes it easy to feel part of his team."

Toward these goals, Diery has made quick and noticeable changes. One such change was pushing full profit-and-loss responsibility down to Wang's six

Diery's blueprint for turnaround

Ian Diery, Wang's senior vice-president of U.S. operations, has laid out a blueprint for turning around the troubled Lowell, Mass., vendor. Diery says he believes that three strategic aims and six specific objectives will help formulate the turnaround.

Three strategic aims:

- Reorganize with an emphasis on decentralizing responsibility and accountability, thereby increasing responsiveness to the customer.
- Alter the perception and reputation of the products, changing Wang's image from a word processing to information systems company.
- Build the requisite skill levels of all Wang employees to meet the requirements and sophistication of the product line and the marketplace it serves.

Six specific objectives:

- **Get back to profitability.** Wang showed a quarterly profit for the first time in three quarters, but Diery admits the company will not be in the black for the fiscal year.
- **Build consultancy services.** Based on a successful program in Europe, Diery wants Wang's field-service representatives to act as consultants to customers to better support them and create additional revenue for Wang.
- **Standards of excellence.** Diery has designed a competency model for specific areas in the field, and every Wang sales agent will have to meet those criteria to carry a Wang business card.
- **Applications software.** Every major contract is now application-driven, Diery says, and Wang has to demonstrate its capabilities in developing and supporting new software.
- **Software maintenance.** Diery says he believes that the excellence of a company is now measured by its competence in software maintenance rather than hardware maintenance.
- **Quality.** Diery believes the franchise of computer users has broadened and that the definition of quality has changed. Wang must establish both the traditional areas of quality — debugging, customer service, uptime, response times — as well as new ones — engineering and design of machines to meet current user needs.

GLENN RIFKIN

geographic regions.

Diery and Olisa, Diery's former right-hand man in Europe, also initiated Wang's latest television commercials, controversial ads that utilize real corporate MIS situations and unabashed computerese. Their hope is that Wang will finally attain recognition as a computer vendor rather than a word processing company. "Fifteen percent of our business represents 85% of our reputation, and we've simply got to change that," Diery says.

Most importantly, Diery says he is committed to getting Wang back in the black. He admits it will not happen this year and that next year remains uncertain. But he says he believes that the return to profitability is inevitable. "One of the reasons I came to the U.S. is that I know we've got the product line for success and, therefore, the rest can be fixed," he says.

'Madder than hell'

But according to Wohl, the bottom line for Wang is that its customers are "madder than hell," and if they receive one more product from Wang that doesn't work as it's supposed to, such as the prematurely announced VS 300, "they'll find another vendor."

Wang is betting that Diery's enthusiasm and strong personality will help the company win back customer loyalty. The irony is that those very attributes may, in the long run, be Diery's undoing.

"Any leader of that company needs to realize that Wang is a family business and [that] he is never going to get control," Colony says. "That's a big hurdle to get over."

"Two or three years down the road, if Wang makes a huge turnaround, Ian is going to seek his payoff," Seybold says. "I imagine that some kind of confrontation could happen then."

Diery claims that he is "very happy in this situation" and won't be drawn into a debate on the future. Fred Wang insists that Diery's success doesn't portend another Wang vs. Cunningham debacle.

"John wanted to run and own his own company," Fred explains. "That was the key to that problem. There are lots of future roles here for Ian, and as he grows, there will always be new avenues open to him."

MERGERS & ACQUISITIONS

Western Digital Corp. and **Faraday Electronics, Inc.** announced that they have signed a definitive agreement under which Western Digital will acquire Faraday, a Sunnyvale, Calif., company that designs, manufactures and markets CPU board-level and core-logic products.

Western Digital will issue approximately 1.5 million shares of common stock for all of the outstanding Faraday stock, warrants and options.

Faraday lost approximately $1 million in its fiscal year ended March 31, primarily due to write-offs associated with a discontinued business.

The acquisition is consistent with Western Digital's strategy of supplying a wide range of subsystems solutions to its customers and will enable the company to provide IBM Personal Computer XT and AT and Intel Corp. 80386 integrated chip sets to companies making IBM compatible computers.

McDonnell Douglas Corp. has acquired **Frampton Computer Services Ltd.**, a British software company. The company will operate as part of **McDonnell Douglas Information Systems International**, better known by its trade name, **ISIS**.

The purchase price was not disclosed.

Based in Bristol, England, ISIS employs 65 people and has annual revenue of about $5 million. The company specializes in payroll, personnel and pension systems but offers other software products as well. The company will remain in Bristol and continue to operate as ISIS.

3M Co. announced a 10% equity investment in **Logistix** in Milpitas, Calif., a computer software contract manufacturing company.

Founded in 1974, Logistix acts as a manufacturing division for computer software publishers and OEMs, offering complete project management services, including design, manufacturing strategy, procurement, program duplication, assembly packaging, inventory control and quality assurance. Customers include major software developers as well as hardware manufacturers, toy and game companies and biotechnology firms.

Du Pont Co. and **Xerox Corp.** have announced plans to form a joint-venture partnership to develop and manufacture products for the electronic-imaging marketplace.

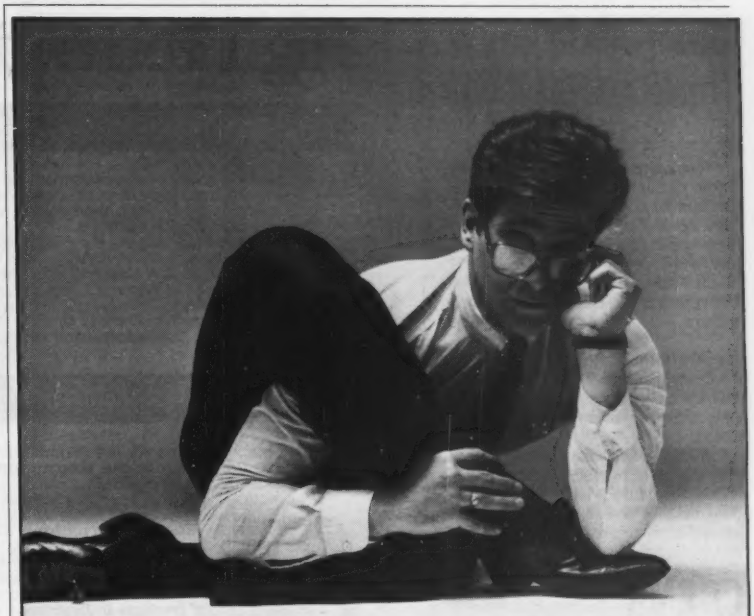
The new firm, to be called **DX Imaging**, will combine the existing efforts of both companies in liquid-toner technology. Du Pont and Xerox have invested a total of about $80 million in this technology and expect to invest another $40 million to support the joint project this year.

Two Irvine, Calif.-based manufacturers of mass-storage devices have signed a letter of intent to merge. **Proapp, Inc.**, a company that makes Apple Computer, Inc. Apple II- and Macintosh-compatible hard-disk subsystems, will merge with **Logic Array, Inc.**, a manufacturer of hard-disk cards for IBM-compatible computers.

The newly merged company will retain the Logic Array name. Proapp will continue to be used as the brand name for the company's line of Apple-compatible upgrades.

Infinet, Inc., a North Andover, Mass.-based subsidiary of Memotec Data, Inc. in Montreal, and **Tesdata Systems Corp.** in Herndon, Va., have agreed to plan a merger by which Tesdata will become a wholly owned subsidiary of Infinet.

Tesdata's stockholders will be asked to approve the plan at a special meeting expected to be held in July. Under the merger plan, holders of Tesdata common stock will receive 15 cents per share.



HOW TO GET SPECIAL PROJECTS DONE WITHOUT TYING YOUR STAFF IN KNOTS.

Now you can get your special data processing projects completed quickly, accurately and cost-effectively without disrupting the workflow of your organization. The solution is project-oriented specialists from Accountemps.

Accountemps data processing professionals are slightly overqualified. Orientation is short and simple. They fit in with your permanent staff and have the expertise to complete special projects knowledgeably and skillfully. You supervise them just like you do your own people. And you don't have to divert your permanent systems analysts, programmers, operators, and data entry personnel from their regular assignments.

The result is that you meet your deadlines, get a professionally done job and save time and money.

Call us the next time you have a special project. We'll send you a data processing specialist, or a team of specialists to pitch in for a day, a week, a month or longer.

Rely on Accountemps.
You'll be glad you did.

accountemps.
data processing
Rent an Expert.

© 1986, Robert Half International Inc.
Offices independently owned and operated.

DP RED BOOK PROVIDES...

40,000 DP users. Each DP Red Book lists 5,000-17,000 computer users covering the NY Metro Area (NY, NJ, & CT), the Mid-Atlantic States (PA, VA, MD, DC, WV, & DE), the New England Area (MA, ME, NH, RI, & VT), and the Chicago Metro Area. Each site includes a profile of the hardware installed, software installed, (languages, databases, etc.), consultants used, future plans, applications, and DP executives' names, titles, and phone numbers. An index provides quick access to 136 cross references by hardware, software and industry. Price: NY-$700, MA-$395, NE-$395, and Chicago-$495. Call (212) 683-0606. Computer Management Research, Inc., 20 Waterside Plaza, NY, NY 10010.

Software world

CONTINUED FROM PAGE 95

purchased Integrated Software Systems Corp. and Software International Corp. from General Electric Co.

The moves, which Computer Associates' Frease said added about $15 million to fourth-quarter revenue, gave Computer Associates entry into the Digital Equipment Corp. VAX marketplace and resulted in an 800-member international sales force.

> "IT'S A misconception that [Computer Associates has] only grown because of acquisitions."
>
> CHARLES TAYLOR JR.
> PRUDENTIAL-BACHE
> SECURITIES, INC.

"Computer Associates is a great example of growth by acquisition," noted Bernard Goldstein, a partner at Broadview Associates, a Fort Lee, N.J., investment banking firm specializing in acquisitions and mergers.

"It's played a significant role in their emergence as a leading systems software vendor."

Acquisitions role overstated

Prudential-Bache's Taylor pointed out that the role of acquisitions in Computer Associates' recent growth may be overstated.

"It's a misconception that they've only grown because of acquisitions," he said. "They have done a lot of good acquisitions, but they have also done a lot of good internal development."

Computer Associates, he said, is expected to spend about 13% of revenue — or $60 million — on research and development this year.

Much of Computer Associates' internal development goes toward integrating acquired software into its product line and providing enhancements to existing products, Taylor noted.

"They've got a development team that is 300 strong," Taylor said.

"It's not as if they have only a couple of people doing development, a situation usually indicative of a company which just acquires products and resells them," he added.

Taylor is looking for the firm to earn $1.1 million in fiscal 1988, on revenue of about $475 million.

CBEMA

CONTINUED FROM PAGE 95

of fire" last year when the U.S. and Japan negotiated a semiconductor trade agreement that increased chip prices dramatically. The computer industry is the largest chip buyer in the U.S., she noted.

The association argued that the chip agreement, spurred by complaints from the U.S. semiconductor industry, levied a "double hit" on computer companies.

Aside from the higher chip prices, the government recently proposed 100% punitive tariffs for a variety of Japanese computer systems and components imported by U.S. firms in retaliation for Japan's failure to comply with all parts of the semiconductor accord. In the end, the government limited the tariffs to 16-bit microcomputers.

These episodes prompted CBEMA to seek rule changes that would give consuming industries a greater voice in U.S. trade sanctions and agreements. "Our industry has paid a high price for problems in the semiconductor industry," said Bill Maxwell, CBEMA's international issues director.

"Under current law, the U.S. grants many rights and privileges to companies complaining that they are injured by specific imports. But it doesn't do enough to protect the rights of companies that depend on these imports," Maxwell said.

Tandem signs Big Eight firm

CUPERTINO, Calif. — Tandem Computers, Inc. recently added a member to its roster of partners in the manufacturing market, signing up Big Eight accounting firm Coopers & Lybrand as a marketing and consulting partner.

New York-based Coopers & Lybrand will work with Tandem as a "solutions implementor," a Tandem spokeswoman said. The two firms will share sales leads and work together on factory automation projects for customers. Coopers & Lybrand consultants will provide services such as project management, analysis, training and support to Tandem customers implementing on-line transaction processing applications for manufacturing. The agreement will specifically emphasize electronics, automotive, aerospace and process manufacturing.

Tandem signed a similar agreement last year with Big Eight firm Arthur Young. The transaction processing systems vendor also has agreements with two Pittsburgh-based manufacturing firms — Dravo Corp. and Westinghouse Electric Corp. — to jointly implement manufacturing systems. Tandem recently announced its intent to develop a formal manufacturing and networking systems agreement with Boeing Computer Services.

High Tech Advertising. When the

COLUMBUS, OHIO • 9:35 A.M.

After three years of development, the PC-based financial planning product of a multinational U.S. company is ready to be marketed in Western Europe and the Pacific Basin.

With a limited budget, the marketing director needs to develop an advertising plan that delivers maximum impact in targeted international markets. First, he needs to know his best prospects, then, how they view his company's products, and finally, what competition he will face.

His solution: Call **International Data Group.**

FRAMINGHAM, MASSACHUSETTS • 9:45 A.M.

The marketing director calls Frank Cutitta, director of **IDG Communications International Marketing Services.**

Cutitta decides that initial research is needed. He immediately contacts Mike Raimondi, director of Database Services for **International Data Corporation's Global Data Resources.**

Cuttita and Raimondi map out a comprehensive **QuikSurv** telephone survey which will poll both MIS professionals responsible for selecting and purchasing similar products in large corporations, and PC end-users who will actually use the product in Europe and Asia.

The marketing director authorizes the study.

E-Mail assignments are quickly sent to IDC's international offices in London, Paris, Munich and Sydney.

SYDNEY, AUSTRALIA • 11:30 A.M.

Cutitta discovers strong competition in Australia where similar but lower-level PC-based financial products are already on the market. He contacts Alan Power, vice president of **IDG Communications' Pacific Region** and general manager of *Computerworld Australia.*

Power recommends a two-tier advertising campaign highlighting the product's technical breakthroughs, and stressing the program's ease-of-use and strong local sales support.

LONDON, ENGLAND • 2:00 P.M.

At the request of Cutitta, Philip de Marcillac, director of **IDC's European Research Center,** prepares a forecast of PC-based financial planning product sales to provide critical information as the team determines how to best reach key corporate targets.

CEO shuffle

CONTINUED FROM PAGE 95

MIS solutions, a bloody management shake-up is the last thing the company needed.

The CEO "bug." The latest victim to be bitten is Robert Miller. Miller departed the No. 2 spot at Westboro, Mass.-based Data General Corp. to head MIPS Computer Systems, Inc., the Silicon Valley maker of reduced instruction set computing OEM products.

Miller is a big plum for MIPS, which, like many technology-oriented start-ups, should benefit greatly from the prestige of gaining a top officer from a billion-dollar vendor.

A similar plot (a double feature, in fact) was played out during the last couple of years at Wang Laboratories, Inc. John Cunningham, and later Carl Masi, moved on to top spots at smaller outfits, saying they wanted to run the whole show. However, isn't it funny how the CEO bug seems to bite at a time when the original employer's financial picture is less than healthy?

The "time to move on" exit. In recent weeks, Cullinet Software, Inc. founder John Cullinane and Compaq Computer Corp. cofounder Bill Murto announced they will step aside — Murto to pursue the ministry and Cullinane to start a noncomputer firm in a field yet to be determined. The historical precedent? Lotus Development Corp.'s Mitch Kapor last year, although Kapor is still actively involved in software development work.

In each of the above cases, the impact of these changes is, or will be, more cosmetic than substantive, because at the management level, each firm is or was essentially running in anticipation of the departures.

Although some would say Lotus has become a more combative company under Jim Manzi, one could also argue that Kapor would have pursued the same lawsuit strategy in a marketplace that has changed considerably.

The "turning over the reins" step-aside. This is a very common scenario when a veteran CEO wishes to depart from day-to-day operations. Usually he will remain chairman — as Bill Norris did before his retirement from Control Data Corp. — and relinquish the CEO and/or president's mantle.

The most recent example is Bertil Nordin at Digital Communications Associates, Inc. (DCA) One interesting twist: The anointed successor, Jim Ottinger, was a top dog himself at Forte Communications, Inc., which DCA acquired last year.

The resignation under adverse circumstances. Robert Wiggins, Paradyne Corp. Federal indictments (now settled) and losses — what more need be said?

Wilder is *Computerworld's* senior editor, computer industry.

World is bigger than your budget.

FRAMINGHAM, MASSACHUSETTS • 4:30 P.M.

Cutitta and Raimondi meet with IDC's QuikSurv's Ken McPherson and Judy Danielson to summarize the survey findings.

Sheryl Merchant, IDG Communications International Marketing Services sales and marketing support manager, uses IDG's global E-mail Network to check foreign currency exchange rates and closing dates for all international magazines.

UNITED STATES, EUROPE, ASIA • 4:45 P.M.

Cutitta initiates a global conference call to review final recommendations with IDC's regional offices in Sydney, London, Munich, Hong Kong and Framingham. His plan is to target MIS professionals by using *Computerworld Australia, Computerworld Asia, Computerwoche, Computerworld Italia* and *Computer News* in England. The PC end-user campaign will stress product documentation, reliability and service, and break in *PC World* editions in England, France, Germany and Australia.

COLUMBUS, OHIO • 5:30 P.M.

The marketing director accepts the IDG recommendation and notes that the media plan prepared by IDG will penetrate all target markets within budget restrictions. He gives Cutitta a final commitment for advertising space in the selected IDG magazines. All the ads will be placed centrally through IDG/IMS in the U.S.

His new product campaign will break in three weeks.

IDG
INTERNATIONAL DATA GROUP

85 magazines
28 research centers
16 languages
1 world.

IDG. The World's Leading Provider of Information Services on Information Technology.
Five Speen Street, Framingham, MA 01701 • (617) 875-5000 • *Operating Companies:* International Data Corporation (Research) • IDG Communications, Inc. (Publishing)

Wang plans joint investment fund

BY BEN LIM
and TOM MCHALE
SPECIAL TO CW

TAIPEI, Taiwan — An Wang, the Chinese-American founder of Wang Laboratories, Inc., recently said he plans to start a $500 million fund to help finance U.S.-Taiwan joint ventures and technology transfer.

Wang met with government officials here in April to finalize plans for an investment fund slated to be launched in June with an initial balance of $100 million. Wang said 60% of the capital will come from private investors in Taiwan and 30% will come from the Taipei government and state-owned companies. The remaining $10 million will come from Wang Laboratories, which will oversee management of the fund.

The fund is intended to enable Taiwanese companies to enter joint technology ventures with established small and medium-size U.S. firms. It will also be used to acquire U.S. firms and transfer U.S. technologies to Taiwan, knowledgeable sources said. When it is fully subscribed, the fund — tentatively named the Golden Gate Development and Investment Fund — is expected to boast capital of $500 million for investment in U.S. companies.

Government advocates of the project look upon the fund as an important step toward reducing Taiwan's embarrassing trade surplus with the U.S.

Countering the growing trade imbalance, which reached $13.6 billion last year and could top $18 billion this year, is a major concern to the country's computer makers, who stand to lose their biggest customers if protectionist legislation passes in the U.S. Congress.

Taiwan began to invest in U.S. industry three years ago, the Ministry of Economic Affairs' Investment Commission said. The commission approved only about $2 million in overseas investments from 1981 to 1983, but statistics indicate that investments jumped to $30 million in 1984, with about $25 million going into the computer and electronics field. In 1985, total overseas investment rose to $35 million with about $23 million earmarked for the U.S. computer and electronics industries.

Lim and McHale cover the Pacific Rim computer industry for *Computerworld Hong Kong.*

EMPLOYMENT TODAY

Dancing in industry's spotlight

Vendor MIS managers get equipment but must perform under pressure

BY MICHAEL BALL
SPECIAL TO CW

Working for a computer industry vendor is like performing on Broadway. The stage is set with all the equipment you need, but you have to be able to dance in the spotlight.

That is an assessment made by many MIS managers who prefer reaping the rewards and tolerating the difficulties of working inside vendor operations.

"The big advantage is that we're not a back-room service," says Dean Redfern of McCormack & Dodge Corp. in Natick, Mass. "We're a focal point, like a manufacturing assembly line."

MIS benefits from being on the front line, Redfern adds. "First, you become very visible and report very high up. Second, lots of cash is thrown at you, and the percentage spent on MIS is significantly higher than in other kinds of companies," he says.

On the other hand, increased visibility puts pressure on MIS. "The bad news is that you're expected to perform at a much higher level than in other companies, and your services have to be available constantly and quickly. You've got to run a Cadillac operation, and you can't scrimp on talent or work," Redfern says.

With the executives looking over your shoulder, your every success and failure is known. "They see an hour's worth of downtime as an hour's worth of lost development," Redfern says, "and that's our business."

'Warts and all'

The vendor MIS manager must also settle for the kinds of equipment his company provides rather than shop around. "You get all the hardware you want, but you take it warts and all," says Robert Elliott of Apollo Computer, Inc. in Chelmsford, Mass.

While many vendors do not absolutely require their MIS managers to use only their own products, most have unwritten policies that are followed religiously by the managers.

Apollo, a scientific and technical workstation vendor, is an exception to this rule, Elliott says. Because the company's MIS organization grew faster than the development of its own products, Elliott is in the luxurious position of choosing the equipment that provides the best solution rather than the systems that bear the company label. The company is free with its resources because "everybody here understands the role of applied technology," he says.

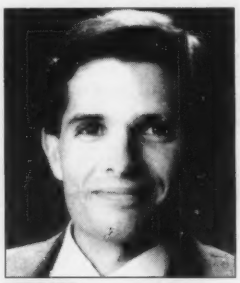
Similarly, Lloyd Taylor of Hewlett-Packard Co. in Palo Alto, Calif., says that the executives in his firm understand the MIS department and its needs. "At the head of the list of benefits is that you wind up with a more enlightened management," he says. But Taylor adds that he does not always get everything he wants for his operation. "You still have to sell your ideas and needs, but management understands the use of equipment and is far more accessible."

The drawbacks of using only the company's equipment are balanced by access to corporate resources. Taylor says that the most important of these resources is probably not all the hardware, software or money. "Unlike a noncomputer company, we have almost unlimited consulting resources," he says.

Another difference between vendor MIS and that of other companies is the interplay between internal operations and product development. "You have the opportunity to influence the design of the products here," Taylor says. Because of this relationship, MIS can help tailor certain products to suit its needs and methods.

As with the other benefits, working closely with development can be difficult. Vendor MIS departments must often act as test sites, mixing new product tryouts with production work.

The interrelations between MIS and developers is even stickier at M&D, Redfern says. "Everybody in the company becomes a customer. Everyone all the way up to Frank Dodge uses a PC and is a potential software developer," he says. "As a result, input comes from many places simultaneously, and software development is not under the control of MIS."



"YOU'VE got to run a Cadillac operation, and you can't scrimp on talent or work."

DEAN REDFERN
MCCORMACK & DODGE CORP.

To cope with this situation, Redfern says, the company hires multiple DP managers: "One for accounts receivable software and one for human resources programs and one for every other kind of software we sell."

The managerial implications of this setup affect both daily dealings and staffing decisions. The various data processing managers "all do their own development, and you have to get a consensus before you get a resource," Redfern says. "Therefore, we need very talented managers to deal with that innate matrix problem."

M&D constantly redefines what sorts of skills and experience it wants from new employees. The company tends to hire a mix of old hands and recent graduates. This mixture contrasts with some of the larger computer companies' MIS departments, which often hire only trainees to combat attrition.

Other vendors, like HP, are changing their hiring patterns to meet new internal demands. "We're gradually adjusting the profile of MIS professionals, because the MIS business itself is changing," Taylor says.

HP recruits most of its new employees from colleges. The company is particularly interested in students about to graduate with MBAs. "We used to look for Mr. Inside — a true technocrat. Now, we're looking for those who can mix general business knowledge and skills with technical ones," Taylor adds.

Ball is a free-lance writer based in Boston.

% ATTN: GURUS

Immediate openings for System V / 4.3 BSD UNIX ® operating systems kernel designers and internals GURUS.

Current projects involve design, porting, and performance evaluation for the following architectures: multi-processor supercomputer, N-cube, mini, and 680x0 machines.

Locations include our headquaters in Naperville, IL with some travel/assignments in AZ, MN, CO, and OH.

For consideration phone 800-524-8649 ext. 630, or send your current resume to:

Lachman Associates, Inc.
1901 North Naper Blvd.
Naperville, IL 60540-1031
Attn: CW
or UUCP: ..!laidbak!jobs

Equal Opportunity Employer
UNIX is a registered trademark of AT&T

On-Line Software International, Inc.

SR. SOFTWARE SPECIALIST

DataVantage,™ the leading IMS and DL/1 Productivity Aid, just won the prestigious ICP *Ten Million Dollar* sales award. We have ambitious enhancement plans and need a talented individual to expand our DataVantage development team.

The candidate should have very strong Assembler skills and an IMS/DB or DL/1 data base background. IMS/DC, CICS, or ISPF Dialogue development is a plus.

This position, at our Fort Lee, NJ headquarters, offers a highly competitive salary and the kind of dynamic and exciting environment where your contributions can make a difference. Our comprehensive benefit package includes dental coverage, paid prescriptions, and a 401(k) plan.

Fort Lee affords a suburban work setting, yet is just minutes from New York City's theaters, restaurants, and cultural excitement.

If this unique opportunity to join a successful, fast-paced, software developer appeals to you, please send your resume and salary requirements to Dept. DVT-1.

On-Line Software International, Inc.
Dept. DVT-1
Two Executive Drive
Fort Lee, NJ 07024
An Equal Opportunity Employer m f h v

SAUDI ARABIA

SYSOREX INTERNATIONAL, a California corporation and a rapidly growing systems management company, now developing innovative multi-technology systems in Saudi Arabia, has the following challenging position:

Quality Assurance Specialist

BS in Computer Science or related field required. Responsible for the analysis, coordination, testing and implementation of computer systems in the field of finance, payroll, personnel and related systems.

5 yrs. experience in the following computer related fields: systems analysis and design; systems integration and quality assurance; automated test tools development; procedures development and documentation; user interface and training; CICS, ADABAS, TSO and COBOL.

Fluency in English & Arabic is mandatory.

We offer an excellent benefit package including medical, life, accidental death, disability and profit sharing plans. You will additionally receive 25 working days vacation, free furnished housing, annual return home travel, paid relocation expenses, plus eligibility for present Federal Income Tax exclusions.

Please send resume with present salary history, to Personnel Dept. CW-5/18, SYSOREX INTERNATIONAL, Inc., 10590 N. Tantau Ave., Cupertino, CA 95014. U.S. CITIZENSHIP REQUIRED. Principals only, please.

SYSOREX
Sysorex International Inc.

SYSTEMS & PROGRAMMING RESOURCES, INC. will soon hire a number of qualified M.I.S. consultants in response to client demand in the Milwaukee, Madison, and Fox River Valley areas of Wisconsin.

S.P.R. is a 15-year old firm offering a variety of challenges to our employees in applications and technical environments. We can demonstrate career growth for members of our staff; and our benefits are comprehensive, including medical, dental, paid holidays, etc. Our low turnover and high retention rate give us an excellent reputation for security and stability.

If you have more than three years' experience with IBM mainframes using:

MVS, DOS or Pick operating systems; COBOL, PL/1, NATURAL, or ADSO languages; CICS or IMS-DC teleprocessing monitors; IMS-DB, DB-2, IDMS, or ADABASE databases; and Yourdon, Method-1, or other development methodologies with structured code;

and you wish to explore vastly expanded horizons with a prominent and growing Midwest-based firm, please send a resume in confidence, or call:

LAWRENCE A. STICH
Manager, Employment

SPR

175 N. Patrick Blvd., Suite 150
Brookfield, Wisconsin, 53005
(414)-792-0150

Opportunities are also available in:

CHICAGO	DALLAS	ST. LOUIS	TULSA
1100 Jorie Blvd. Room 355 Oak Brook, IL 60521 (312)990-2040	2120 R.P.R. Tower Plaza of the Americas Lock Box 308 Dallas, TX 75201 (214)922-9214	1810 Craig Road Suite 203 St. Louis, MO 63146 (314)878-7774	400 Mid-Continent Tower 401 South Boston Tulsa, OK 74103 (918)587-8825

AN EQUAL OPPORTUNITY EMPLOYER M/F/H

CICS/IMS/VSAM DP Series

When top-10 consulting firms like Cap Gemini America and Computer Task Group adopt our publications over others as the training reference manuals of their CICS IMS consultants, that says a lot about the quality of our publications. In fact, more than 33,000 DP professionals have chosen our publications over others. Our publications are so good that we have a life-time guarantee for them – You must be completely satisfied or you may return the book(s) at ANY TIME for a full refund. Knowing CICS or IMS is a must for today's DP professionals. So order your copies today!

CICS/VS Command Level Programming with COBOL Examples By David Lee $29.95
Used by 15,000 CICS programmers. Considered the best by many DP pros. Presents more examples, sample programs and techniques than the other two CICS books combined. 273 practical examples. 15 most important CICS applications, each is demonstrated by a sample CICS program. CICS mapset coding, Pseudo Conversational CICS program design, coding, testing and implementation. CICS Internal Table Setup, CEDF Debugging, CEMT and CSMT usage, Dump Reading, Production Abend Handling, Online report printing, Menu-driven, Data Entry, Inquire/Update, Browse. VSAM Alternate Index processing, Automatic Task Initiation and much more.

CICS/VS Online System Design and Implementation Techniques By David Lee $29.95
Just published! This book is a must for all CICS programmers and analysts who want to gain 3 years of heavy CICS experience within several months. It contains 4 parts. Part 1 covers CICS advanced features. Part 2 covers CICS design, testing and implementation techniques that you must know to survive in the real-life CICS environment. Part 3 lists 100 most common CICS application problems that a CICS programmer may encounter on a daily basis and their solutions. You can gain a lot of problem-solving experience instantly by having this list. Part 4 presents 15 most important CICS applications, each is demonstrated by a sample CICS program.

IMS/VS DB/DC Online Programming Using MFS and DL/I By David Lee $29.95
Published in '85. Used by 6000 IMS DB/DC programmers and adopted by AT&T. The only complete and practical IMS VS DB/DC programming guide in the market. 245 practical examples. Nine major IMS DB/DC applications are presented. MFS format coding, MPP program design, coding, testing and implementation, BMP programming, BTS II Testing and Abend handling.

IMS/VS DL/I Programming with COBOL Examples By David Lee $29.95
This book covers all the basics of DL/I data base and DL/I batch programming with introduction to IMS DB/DC online programming. 212 practical examples. 10 major IMS VS applications. DL/I data base concepts. DL/I call usage. DL/I batch program design, coding, testing and implementation. DL/I JCL setup. BTS II Testing. Data Base Access Methods. DBDGEN and PSBGEN utility usage. Data base load. Logical Data Base and Secondary Index design and processing, and more.

VSAM Coding in COBOL and VSAM AMS By David Lee $19.95
Become a VSAM expert in just one month! A practical guide for COBOL programmers using VSAM files. Fourteen major VSAM applications written in COBOL. 53 AMS examples to cover all types of VSAM file creation and maintenance. Many practical COBOL examples, and OS VS or DOS VS JCL on VSAM files. $17.95 copy (4 or more).

Order Your Copies Today! To order by credit card (VISA or M/C), call TOLL FREE 1-800-851-5072 or 214-248-7642 (in Texas). To save S&H charges, send $29.95 copy or $24.95 copy (4 or more copies) to the address below. Allow 1 to 2 weeks for delivery.

Unlimited Guarantee: Full Refund At Any Time If Not Satisfied.

CCD ONLINE

CCD ONLINE SYSTEMS, INC.
TOLL FREE 1-800-851-5072
16990 Dallas Parkway, Suite 151, Dallas, TX 75248

DATABASE ANALYST

Tenneco West has an immediate need of a Database Analyst to work in our IBM 43XX shop. Tenneco West is headquartered in Bakersfield, CA, located in the San Joaquin Valley of California, participating in agricultural, manufacturing land development and retail businesses.

The successful candidate should have a 4 year degree or its equivalent and 2-3 years experience in Systems and Programming with 2 years or more as a Systems Analyst, Programmer Analyst or Programmer. Experience with MVS/JCL and working knowledge of COBOL and Assembler languages is a must. Database Analyst assists in the analysis, planning and design of corporate database and general knowledge of Data Analysis, Data Management, along with good oral and written communication skills.

Duties and responsibilities will include assisting in the:

- analysis of database request
- logical and physical database design
- implementation and maintenance of corporate database
- data dictionary maintenance
- systems and programming personnel designing implementation and testing of databases

To be considered for this position, please forward your resume and salary history in strict confidence to:

TENNECO

Personnel Manager, Food Division
TENNECO WEST
PO Box 9380
Bakersfield, CA 93389

EOE A Tenneco Company m/f/h

NEW ENGLAND

BOSTON
IDMS ANALYST
If you're well-versed in IDMS sys. devel. & looking for a step up, call us for this unique oppty. This prestigious fin'l. svcs. firm seeks tech. bus. sys. analyst for new apps. devel. in invest. portfolio acctg. Prev. MVS, IDMS, ADS/O, COBOL & full cycle proj. accomplishments req. Salary to $45,000.

BOSTON
IMS/CICS P/A's
Prominent F-100 corp. seeks tech. talented pro's for diverse proj. assignments. Environ. is multi-CPU OS/MVS IMS DB/DC + CICS. Your solid COBOL devel. exp. & exposure to either CICS or IMS qualifies you for exceptional tech. challenge & adv. oppty!

BOSTON
SENIOR P/A — HP3000
Highly regarded Rte. 128 mfg. firm seeks Sr. P/A with solid blend of analysis & tech. skills. Environ. is multi. HP3000's COBOL IMAGE YGL. Oppty. to join growth co. in hi-vis. dept. doing new devel. Salary $32,000.

HARTFORD
CONSULTANTS
3+ yrs. exp. w/IMS, CICS or IDMS along with good tech. & interpersonal skills qualifies for oppty. with prestigious nat'l. consulting co. Positions in Northeast, South & Southwest. Excellent growth potential. Salaries $30,000-$50,000.

HARTFORD
SOFTWARE PROGRAMMER
Min. 5 yrs. sys. programming exp. with IBM software products (ACF/VTAM, NCP, NCCD). Knowledge of MVS fundamentals and the ability to diagnose network problems pref'd. Salary to $40,000.

PROVIDENCE
INFO. CENTER ANALYST
Fast-track Providence svc. firm seeks user-oriented FOCUS spec. to act as info. consultant. Define user problems, identify & implement solutions & conduct training. Req. MVS/TSO bkgrd. Full benefit & reloc. Salary to mid $30's.

ROBERT HALF

RH

EDP PERSONNEL SPECIALISTS
Contact the Manager of any office listed below.

100 Summer St., Boston, MA 02110
(617) 423-1200
111 Pearl St., Hartford, CT 06103
(203) 278-7170
900 Turks Head Bldg., Providence, RI 02903
(401) 274-8700

®

Client Companies Assume All Fees.

Choose from 100s of top, new career openings—nationwide

Contact our team of career specialists today

Client cos. pay employment fees

SUNBELT—IBM 30XX, 43XX, COBOL OS/MVS; IDMS; PAs & SAs
MALI, INC.
360 Bay St. Suite 180, Augusta
GA 30901 • (404) 722-6806

SPERRY • DATA GENERAL • WANG
Project Leaders
EXETER 2100
Computer Park, P.O. Box 2120
Hampton, NH 03842 • (800) 258-7328

Banking Applications—IBM
All levels to $70,000
HANNAH/ROWE INC.
P.O. Box 514, Bloomfield, CT 06002
(203) 243-0424

BANKING AND BROKERAGE SYSTEMS
N.Y. Metro Area $30-580K+
EXECUTIVE DIRECTIONS INC.
2 Penn Plaza, Suite 1185
New York, NY 10121 • (212) 594-5775

SUNBELT—IBM—PA—S/A—S/P
To Low 550s • Healthy, positive environments
INTERSTATE PERSONNEL ASSOCIATES
407 Osborne Office Center
Chattanooga, TN 37411 • (615) 892-2868

DEFENSE/MILITARY APPLICATIONS
Software • Quality Assurance • IV & V
RSVP SERVICES, DEPT. C1
One Cherry Hill Mall, #700
Cherry Hill, NJ 08002 • (609) 667-4488

nna computer/net

EAST CAROLINA UNIVERSITY

Computing & Information Systems is currently looking for highly motivated, talented individuals for positions in administrative applications development. The following positions require experience and the appropriate educational background. Analysis experience in financial applications is required for the Analyst/Programmer positions. Must know Cobol and have worked on either large IBM or UNISYS 1100 computers.

Senior Applications Analyst/Programmer Specialist (Salary $29-33k).

Applications Analyst/Programmer (Salary $27-31k).

Computer Programmer (Salary $22-25k).

Send resume to: **Personnel Department, East Carolina University, Greenville, NC 27858. (919) 757-6353.**

An Equal Opportunity/
Affirmative Action Employer

Federal law requires proper documentation of identity and employability prior to final consideration of these positions.

APPLICATION DEVELOPMENT SPECIALIST

CDI-Computer Dynamics, Inc. is a well established diversified services company with offices in major markets around the U.S. Our Application Development Specialists utilize structured techniques within the full range of the project life cycle. Your expertise in business systems will assist us in the development through implementation of current and planned projects in a variety of processing environments for billing, financial, manufacturing and personnel systems. Our current needs require at least 2 years of experience with either:

- IMS DB/DC
- DB2/SQL
- MODEL 204
- CICS/DL1
- FOCUS
- IDMS/ADSO
- COBOL
- PL-1

Our comprehensive package of benefits includes: Full Insurance Program, 401K, Profit Sharing, Tuition Reimbursement, Holiday and Vacation Pay as well as being compensated above average. No matter what location you choose, you will find opportunity…

For more information, please forward resume or CALL COLLECT:

CDI COMPUTER DYNAMICS, INC.

6600 N. Andrews, Ste. 227
Ft. Lauderdale, FL 33309-2110
(305) 492-9745

710 N. Post Oak, Ste. 306
Houston, TX 77024
(713) 683-0134

2301 East Lamar Blvd., Ste. 322
Dallas, TX 76006
(817) 649-0222

Equal Opportunity Employer — *PRINCIPALS ONLY PLEASE*

CONSULTANTS

Advanced Programming Resolutions, Inc., a dynamic, growth-oriented, computer consulting company, has Engineering Consulting positions available in Chicago and Columbus, and Business Consulting positions available in Columbus.

APR provides you with an excellent salary, comprehensive benefits including major medical, dental, long-term disability and a 401K pension plan, and the opportunity for professional growth and development.

Engineering Consultants for Chicago and Columbus requires:

- B.S. in Computer Science; M.S. a plus
- 1 (yr.) or more work experience in any of the following areas:
  - *Real-time software design and development within a UNIX/C environment
  - *Call processing software design and development
  - *Switching system requirements and architecture
  - *System integration, system testing, and device drivers
  - *Operating systems development, and local area networks

Business Systems Consultants for Columbus requires:

- (3-5 yrs.) minimum working experience in any of the following areas:
  - *IDMS, IMS/DB, ADABAS
  - *ROSCOE, DATATRIEVE, VSAM, VTAM, OSJCL
  - *COBOL, PL/1, ASSEMBLER, FORTRAN
  - *MANTIS, NATURAL, ADSO, IDEAL, CICS, IMS/DC
  - *VAX/VMS, DOS/VSE, VM, MVS
  - *NCR environments including PARADOX

OUR SUCCESS IS OUR PEOPLE!

Please submit your resume to:

Robert D. Williams
Manager of Corporate Recruiting
Advanced Programming Resolutions, Inc.
2715 Tuller Parkway Drive
Dublin, OH 43017
(614) 766-6901

An Equal Opportunity Employer M/F/H/V

UNIX is a trademark of AT&T Bell Laboratories

APR

Health Care Programmer/Analyst

As a staff consultant for Compdata you will receive top salary & benefits. Extensive travel required. Current openings for people experienced with membership, claims, especially ASA SYSTEMS. Send resume to:

John Cassandra

COMPDATA

936 Silasdeane Highway
Wethersfield, CT 06109
or call toll free
1-800-843-2319

1000 DP Opportunities

IMS Data Base Anal (2-7 yrs)	35-45K
IDMS Data Base Anal (1-7 yrs)	33-45K
DB2 Data Base Anal (5-10 yrs)	40-50K
DATACOM Data Base Anal (2 yrs+)	35-43K
EDP Auditor (2-5 yrs EDP Audit)	26-39K
MODEL 204 Prog/Anal, Sys Anal (5 yrs+)	25-43K
IDMS-ADS/O Prog/Anal (2 yrs+)	25-35K
ADABAS/NATURAL Prog/Anal (2 yrs+)	27-36K
CICS Prog/Anal (2 yrs+)	25-35K
ADR/DATACOM/IDEAL Prog/Anal (2 yrs+)	25-32K
IMS DB/DC Prog/Anal (2 yrs+)	25-35K
TANDEM/TAL Prog/Anal (2-5 yrs)	27-36K
S/38 Prog/Anal (2-5 yrs RPG III or COBOL)	26-33K
Retail Prog/Anal (2-5 yrs Retail or POS Apps)	25-33K
Bank Prog/Anal (2-5 yrs Bank Apps)	24-33K
Mfg Prog/Anal (2-5 yrs Mfg Apps)	26-34K
Insurance Prog/Anal (2-5 yrs Ins Apps)	23-30K
Sys Prog (1-5 yrs MVS or CICS)	27-40K

What do you want? A better opportunity, a more challenging position, a change in geographical location? We have the resources to assist you in enhancing your career. Largest employment agency in Charlotte, in business since 1975, 150 affiliates, 1000 client companies. Fee paid.

Rick Young, CPC (704) 366-1800
Corporate Personnel Consultants, Inc.
3705 Latrobe Drive, Suite 310
Charlotte, N.C. 28211

SENIOR INFORMATION SYSTEMS ANALYST

RESPONSIBILITIES: To provide technical expertise in the analysis, design, approval and procurement of data processing, office automation and other hardware and software systems, on a city wide basis. Act as consultant to the Director of Information Systems, as a technical resource for OMB, and for various city agencies.

REQUIREMENTS: Master's degree and 3 years of experience in applicable field, or a Bachelor's degree and 5 years of acceptable experience.

New York City residency required. Candidate should have practical experience in the design, creation and installation of 1 or more substantial data processing systems.

COMPENSATION: Low to mid $40's.

Send resume and **salary history** to:

NYC Office of Management & Budget
One Center Street, Room 1237 LT
New York, NY 10007
EOE

Consulting careers like you've never had!

CAP GEMINI AMERICA is a vibrant, international company on the leading edge of creative, sophisticated data processing consulting services. Our growth continues throughout the country and we have outstanding opportunities in our Tampa office for individuals who currently have 2 years experience in any of the following:

DEC VAX	"C" LANGUAGE
CICS	FORTRAN
PL/1	MODEL 204
ADF	IDMS/ADSO
IBM PC	IBM SYSTEMS PROGRAMMER
DB2	UNIX/XENIX
	SYSTEM 38/RPG III

We provide highly competitive salaries, liberal benefits and a supportive working environment. Call or submit your resume with salary history to:

Patricia Horne
CAP GEMINI AMERICA
(813) 273-0059
100 W. Kennedy Blvd, Suite 901
Tampa, FL 33602
an equal opportunity employer m/f/h/v

CAP GEMINI AMERICA

MANAGER-MIS/UNIX, C

Midwest manufacturer needs an MIS Manager to handle "shirtsleeves" responsibilities in their AT&T minicomputer environment. Must have solid UNIX, C, UNIFY (or similar database) knowledge and manufacturing applications experience. Great Relocation package. Salary to Mid $40's.

TELECOMMUNICATIONS MANAGER

Service organization needs a Telecommunications Manager with 5 years experience. Must have Data, Voice, Satellite and LAN experience. Manage all those areas with a staff of 15-20. Great visibility and opportunity to make your mark on a growing organization. Salary to $57,000 plus very good fringes.

ROBERT HALF
Data Processing
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

SENIOR FIELD ENGINEER

$30,000 - $40,000 plus bonus. IBM or NAS mainframe and peripheral experience required. Boston/Cambridge area. Excellent opportunity for right individual. Send resume to:

C. W. Steimel
110 MacKenan Dr.
Cary, NC 27511

SOFTWARE ANALYST/ PROGRAMMER

Support business systems. Require degree or equivalent in Data Processing or Computer Science and 3 years experience with business applications design, Texas Instruments 990, microcomputer, COBOL, C, UNIX: Salary is $36,500 per annum. Job location: Glendale, CA. Resume to: Karen L. Redner, M.C.B.A., 425 W. Broadway, Glendale, CA 91204.

MAINE - N.H.

We have specialized in data processing professional placement in Maine & N.H. for a fifth of a century. If you qualify for positions in the $25-50,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

ROMAC

Att: Dept. 2
P.O. Box 7040 DTS
Portland, Maine 04112
(207) 773-4749

NEW ENGLAND

• ME • MA • NH • VT • RI • CT • NY •

All outstanding places to live and work. Our extensive client list covers Fortune 500 companies in major cities to small intimate shops in quiet country settings.
Positions range from one yr. Batch COBOL Programmer to Systems Programmer in IBM, DEC, Honeywell, HP and Tandem environments.
For more information contact Mitchell Price (413) 586-9961. Send resume in confidence to:

HANS PRICE ASSOCIATES
HP **P.O. Box 747**
Northampton, MA 01061

Programmer

IBM S/38 RPG III

Programmer/Analyst with 3 to 5 years experience needed to develop new applications software.

Send resume to: Stephen Tsangrides, PO Box 2246, San Francisco, California 94101.

SYSTEMS/ PROGRAMMING

Our Pasadena based Systems & Programming department will be relocating to Orange in mid-September. We are currently seeking an Analyst Programmer, Sr. Programmer, Sr. Systems Analyst, and Lead Analyst.

Requirements include:

- 2-5 years experience working with a Tandem computer
- 2-12 years programming experience
- Familiarity with COBOL, BASIC, SCOBOL, and TAL
- Experience in problem definition and resolution
- System design experience preferred
- Programmer leadership skills
- Ability to interact with the user

Transamerica offers competitive salaries and excellent benefits. For immediate consideration, please send resume and salary requirements to: **Human Resources, Transamerica Financial Systems & Concepts, 845 El Centro St., So. Pasadena, CA 91030.**

Transamerica

Affirmative Action/Equal Opportunity Employer

SENIOR PROGRAMMER/ ANALYST

Responsible for all system development in a wide range of application environments. Minimum 5 years COBOL application programming experience, interactive systems design, covering fiscal and manufacturing or service delivery applications. Demonstrated competence at the highest technical level of all phases of application systems analysis and programming activities. Starting salary $35K+. Send resume and salary requirements to:

Philadelphia Corp. For Aging
Director of MIS
111 North Broad St.
Philadelphia, PA 19107
EOE

SOFTWARE ENGINEER FOR SOUTHWEST AREA

If you are looking for a new exciting career opportunity and have any of the following skills . . . IBM Series/1, CICS, PC Assembler, C Language, DEC VAX or Communications, then we may have just the job for you. We are a software and services company with a good reputation and a growth plan which demands talented people. Send resume to:

Box #CW-84916
Computerworld
P.O. Box 9171
Framingham, MA 01701-9171

COMPUTER SOFTWARE ENGINEER. Direct micro computer system design, testing and implementation utilizing LISP, C, Clippers, Prolog, Assembler, and other advanced systems application for engineering operation, including CM and PM planned maintenance, distillation, reflex, condensation, recirculation and HVAC operation, instrumentation and control I/O system, ATM-PC interface and generation systems. Must have Bachelor's degree in Computer Science, Computer Engineering or related fields, and one year software engineering, systems analysis or related experience involving LAN - mainframe interface. Must have demonstrated knowledge and abilities in systems engineering maintenance, and applicable micro computer systems, peripherals application in configuration requirement. Salary: $30K plus bonus. Send resume to: Mr. Poretsky, 9319 North Marine Pacifica Drive, Long Beach, CA 90803.

WANTED: EDP EXCELLENCE

Numerous positions available at all levels, including MIS Directors/Managers, Systems Managers, Project Managers/Leaders, Systems Analysts, Programmer Analysts, EDP Consultants, EDP Auditors, Decision Support. Key Positions in Business and Industry available coast to coast. All fees employer paid.

As veteran recruiters for Blue-Chip corporations, we have advantageous opportunities for outstanding professionals.

Contact: JOHN SOWERS
MARVEL CONSULTANTS, INC.
3680 Orange Place
Beachwood, OH 44122
(216) 292-2855

Southeast DP OPENINGS

Major clients in the SOUTHEAST are seeking experienced D.P. Professionals with COBOL or ASSEMBLER, with an IDMS, IMS, DATACOM, or CICS background.

Call or send resume to:

DataMasters™
P.O. Box 14548, Dept. CW-A
Greensboro, NC 27415-4548
(919) 373-1461 - collect
FEE PAID

SYSTEMS ANALYST- Analysis, design & implementation of commercial applications for development of complex real time/data base system using CICS, DL/1, COBOL, MANTIS. Design of technical structure for system programs & program interrelationships. Includes significant on-line enhancements in CICS/DL/1, complicated DL/1 programming, real times update processing & complex structuring techniques. Use MANTIS as 4th generation development tool & EASYTRIEVE/PLUS under DOS/VSE & VM. Design test data for program, link and system testing. 4 yrs exp or 4 yrs related programming exp. Must have proficiency in CICS/DL/1, COBOL & MANTIS for program development. Must know DOS/VCE, VM EASYTRIEVE/PLUS & large IBM mainframes. $45,000/yr, 40 hrs/wk. Send resume to: Pinkerton Computer Consultants, Inc., 20 Broad St., Suite 1302, New York, NY 10005. (AJ-596)

NATURAL-ADABAS

PROGRAMMERS AND ANALYSTS

SPL is the world's leading developer of custom application systems using Natural/Adabas.

We are a group consisting of, and run by, people who want to do only the highest quality work in a stimulating, politics-free environment.

In the USA, we have offices in SAN FRANCISCO, CHICAGO and LOS ANGELES; provide consulting services to Natural/Adabas users and teach SAGNA's 4th Generation System Design class.

Internationally, we also sell and support the SAG products out of our offices in Australia, Hong Kong, Israel, New Zealand, the Philippines, Singapore and South Africa.

We need people for our CHICAGO and LOS ANGELES offices.

If you are an enthusiastic Natural programmer or analyst (and very good, of course), who wants to build high-quality, successful systems, write now.

SPL

systems programming limited
110 The Embarcadero, San Francisco, CA 94105

NEW YORK, NEW JERSEY
NEW ENGLAND
PROG'RS
PERMANENT
AND/OR CONSULTANTS
IMMEDIATE OPENINGS

--IBM--
- Systems Prog'r - IMS, DB, DC Z-CAP a plus

--BURROUGHS--
- Prog'rs-ALGOL, DMSII

--DEC--
- Proj Mgr-VAX, INGRES, C
- Prog'r-VAX, INGRES, C

--HONEYWELL--
- Database Administrator, DMIV

Call 212-398-9891
or submit resumes to:
Mr. Dewey Raymond,
HANK WALSH ASSOCIATES
16 W. 40 St., NY, NY 10018

PROGRAMMER ANALYSTS

Leading Westchester manufacturer has an excellent career opportunity for candidates who possess at least 2 years experience with Hewlett Packard 3000, Series 44, 48 or 68 and strong COBOL. Knowledge of QUIZ and RPG II helpful. Strong communication skills necessary.

Starting salary up to $40k, depending on experience - plus benefits package. For immediate consideration, please forward resume with salary requirements to:

Edie Holbrook
C/O PVC
700 Nepperhan Avenue
Yonkers, New York 10703
An Equal Opportunity Employer M/F

Data Processing Professionals

STEP UP TO CONSULTEC!

Programmer Analysts
Senior Programmer Analysts
Systems Engineers

CONSULTEC, INC., a national leader in systems development for on-line, interactive data base applications, is growing rapidly. We seek a select group of competent and ambitious individuals to become a part of this exciting long-term growth.

Current positions, involving the design and development of on-line data base applications exist in:

HARTFORD, CONNECTICUT
ATLANTA, GEORGIA
COLUMBUS, OHIO

The ideal candidates will be degreed and have three or more years of programming experience using COBOL on IBM/OS/MVS mainframes with good technical skills in VSAM, JCL, IMS or CICS.

We are **not** a contracting firm. We design, develop and implement large, complex high-volume systems on a project basis and our staff consists of the very highest caliber of talent. Training in data base or on-line development, growth into management, and relocation assistance are offered.

CONSULTEC offers the qualified candidates competitive compensation, excellent benefits and an outstanding environment for professional development. If you meet our requirements, send your resume in confidence or call today: **H.W. Burmeister, Manager of Recruiting, CONSULTEC, INC., 6065 Roswell Road, N.E., Suite 800 Northside Tower, Atlanta, GA 30328, (404) 252-2883 or 1(800) 358-2381.**

We are an equal opportunity employer.

Consultec, Inc.

DATA PROCESSING OPPORTUNITIES

Meet New Career Challenges In A Professional DP Environment!

Blue Cross & Blue Shield of Virginia, an acknowledged leader in the healthcare insurance industry, has opportunities available for EXPERIENCED PROGRAMMERS at all levels.

Qualified applicants must have software experience in an IBM mainframe environment. Additional experience in any of the following areas is desirable: TSO, ISPF, IMS DB/DC, CICS, FOCUS, and VSAM.

Our central Virginia location is close to Virginia Beach, the Blue Ridge Mountains, and the nation's capitol. We offer excellent starting salaries and benefits too numerous to list. For confidential consideration, send resume with salary history and requirements to: **Human Resources Department-DB, Blue Cross & Blue Shield of Virginia, PO Box 27401, Richmond, VA 23279.**

Blue Cross
Blue Shield
of Virginia

An Equal Opportunity Employer M/F/H/V

The best EDP people in the Bay Area pass through our doorway

You can be one of them; for nearly 15 years the best companies have relied on CRG to find superior data processing professionals to meet their needs. To find out what we can do for you, call today or mail your resume to: **Computer Resources Group, Inc., 303 Sacramento Street, San Francisco, CA 94111, (415) 398-3535, or 3080 Olcott Street, Suite 130A, Santa Clara, CA 95054, (408) 727-1658.**

The Computer Resources Group, Inc.

An Affiliate of National Computer Associates

Send resume to Employment Security Department, Attention AEC Division #45906, Olympia, Washington 98504.

Job Description: Development of software languages capable of describing test instrumentation capabilities, and development of codes required to affect these capabilities in standard manner. Languages must be endorsed by IEEE through liaison with IEEE P981-committee and must conform to both IEEE 488 bus interface specification and other specifications to be determined. Position includes writing of device models utilizing test instrumentation and typical measurement techniques (anomalies of operation and validity of results) supporting the development of the above languages, with respect to software products to be produced.

Requirements: BS in Electrical Engineering, 1 year work experience as Systems Analyst, 3 credits *and* 1 year industry experience with measurement science (which can has been included in the work experience as a Systems Analyst).

Salary: $16.80 per hour, 40 hours per week in Bothell, Washington.

System Developers
800-231-5920

Inviting resumes from individuals in the more highly technical computer related vocations such as: PHD Computer Scientists, Operating System Developers, Data Base Developers, Porting Specialists, Networks and Telecommunications, Architecture, Artificial Intelligence, Graphics Systems Developers, Microcoders and Firmware Developers, Compiler Development, etc. Special interest in emerging technology such as novel architecture, UNIX, ADA, etc. Stroller interest in scientific applications developers including military, process control, data acquisition, telemetry and communications, CAD/CAM, simulation and modeling, etc.—we are a professional employment firm managed by graduate engineers. Fees are paid by the employer. All geographic locations. Send resume or call D. A. Rodwine and ask for our free resume workbook & career planner.

Scientific Placement, Inc.
P.O. Box 19049CW Houston, TX 77224 713/496-6100
UNIX is a trademark of Bell Labs

RESEARCH TRIANGLE OPPORTUNITIES

Currently recruiting experienced computer pros with background in any of the following: IBM Cobol, CICS, IDMS, MS, Adabas, Oracle, DB2, SQL, ADR Datacom or Ideal, PL/1, VM CMS, Financial, Mfg., Banking, Claims Processing, MRP II, MSA, MVS JCP, VTAM, ACF or CICS Systems Progrs, Capacity Planners, Best 1, Telecom Analysts, DB Analysts, Into Center Analysts, DEC VAX Mfg. or scientific, DG, Method 1, Spectrum 3, SDM, Pride, Partial listing of local, regional & nat'l fee paid positions. Call or write:

The Underwood Group, Inc.
3924 Browning Pl., Suite 1
Raleigh, NC 27609
(919) 782-1024

SYSTEMS RESEARCH SPECIALIST - Conduct research for University's Computer Research Lab., in development of programs for machine translation of English to Chinese, and in artificial intelligence software in such areas as rule based (expert) systems and parallel processing. Utilize knowledge of LISP & PROLOG, machine translation systems and environments, artificial intelligence and computational linguistics. Must be fluent in English and Chinese. Req'd: Master's in Computational Linguistics or Computer Science; 2 yrs. exp. or 2 yrs. related experience with Computational Linguistics and Translation Programs. Interested applicants, send resume to: New Mexico Employment Security Dept., 226 South Alameda St., P.O. Box 429, Las Cruces, NM 88004. J.O. #178058.

Programmer/Analyst
Systems Analyst
DBA's

Does NEW DEVELOPMENT Excite You?

If so, call collect or send your resume NOW!

We believe working in the sunny Virginia Beach, VA area on new development projects can give you a sunnier disposition. But don't take our word for it, call and find out for yourself.

Metro is a nationally recognized computer software consulting company with an excellent compensation and benefits package. We are currently looking for full-time Staff Members to work on exciting, multi-year, new development projects. Two (2) or more years experience required in one or more of the following skill areas:

*** IDMS ADS/O**
*** DB2**

METRO
Information Services, Inc.

Personnel Dept. 203
807 Lynn Haven Parkway
P.O. Box 8888
Virginia Beach, VA 23450
Attn: Patty Ezell
804/486-1700

DIRECTOR

Applications Development

A prestigious Washington, DC-based Fortune 500 financial services company is seeking a Senior IBM Applications Development professional. This high-profile position offers a unique opportunity to develop a responsive team and to promote leading-edge technology in a dynamic business environment. We provide the excellent compensation and benefits package you would expect from an industry leader.

The Director will be responsible for leading a large staff in the design and development of applications software for state-of-the-art business systems, as well as develop business plans, manage resources and direct training and development for the division staff.

We require a seasoned professional with a Bachelor's degree (advanced degree highly desirable), and experience in computer/data processing services operations, of which 7 or more years have been in a project management position in an IBM/MVS environment. Knowledge of IDMS/R is a plus. Candidates should have good oral and written communications skills, strong knowledge of MIS and DP systems, their capabilities and applications, and the ability to effectively manage multiple projects.

Our employees are aware of this vacancy. For immediate consideration, please send your resume with salary requirements, in confidence, to:

Applications Development
P.O. Box 9420
Washington, DC 20016

An Equal Opportunity Employer

-POSITION NOTICE-
SENIOR COMPUTER SCIENTIST

An immediate opening is available for a Senior Computer Scientist in supercomputing research and development. This is a university position. The primary responsibility of the position is the development, implementation, and evaluation of advanced computer technology. Responsibilities include project management and technical leadership in multiprocessor algorithm and software research, specifically the design and implementation of parallel algorithms in numerical interpolation and approximation, computational fluid dynamics, and numerical weather prediction. The incumbent must be able to converse with parallel processor hardware designers, as well as compilers, operating systems, and parallel languages designers. The incumbent is also responsible for supervising Ph.D. candidates in Computer Science.

Minimum qualifications include: Ph.D. in Computer Science and one year experience as Assistant/Associate Professor. Experience should include work in the areas of: (i) parallel algorithms in fluid dynamics and numerical weather prediction; (ii) parallel algorithms for numerical interpolation and approximation; (iii) software development for massively parallel processors; (iv) writing microcode and assembly language programs for parallel machines; use of Fortran 77, parallel Pascal, and the Unix operating system. (This experience may have been obtained during graduate study.) Must have experience in supervising M.S. and Ph.D. candidates in Computer Science. Four publications (book or refereed journal) in the areas of parallel algorithms and software required.

Salary will be between $50,000 and $62,000, depending upon experience and qualifications.

Send resumes, including names of at least three references to:

Mrs. Wanda Byrd
Illinois Job Service
402 North Randolph
Champaign, Illinois 61820
Ref. No.: 7177-H

This is an employer-paid ad. AA/EOE

American Red Cross

The **American Red Cross** is building the world's largest medical information network to help combat AIDS, hepatitis and other blood-related illnesses. We are also building the largest Disaster Welfare information data and voice communication network. Systems are both information inquiry-based as well as real-time operational hospital services systems with critical urgencies related to the movement of the nation's blood supply. Applications programmers with technical knowledge are especially needed. Also available is a senior management position, Manager, Medical Microcomputer Systems.

Interested persons should forward resume and salary history to:

American Red Cross,
Personnel Services, Department CMIS,
18th & D Streets, N.W., Washington, DC 20006

EOE

Sunbelt Careers • $30,000-$60,000

We specialize in matching career opportunities with talented DP Professionals in the following areas:

- **Technical Support**
- **Data Base Applications**
- **Systems Programming**
- **Project Management**
- **New Data Centers**
- **Major Expansions**

Over 10 years of experience has given us the expertise to represent you to a select group of growth oriented and highly profitable clients. Watch for our *Computerworld* ads in the coming weeks which will highlight select opportunities. For more immediate consideration please call **CAMILLE HANKINS** collect at: **(704) 552-7721.**

Hankins & Associates

5950 Fairview Road • Suite 615 • Two Fairview Plaza • Charlotte, NC 28210

PROGRAMMERS

Software Support & Development

McLean, Virginia

We are Computer Associates International, Inc., the software industry leader serving 80% of the Fortune 500 corporations in the U.S. and recognized worldwide as one of the largest and fastest-growing independent developers and suppliers of Systems, Applications, Data Base Management and Microcomputer software product lines. Corporate expansion and the growth of our rapidly expanding client base in the D.C. area has created these highly visible positions.

- **DOS/VSE PROGRAMMER**
  Position requires 2+ years' experience with ALC and strong programming support skills. COBOL a plus.
- **MVS PROGRAMMER**
  3 - 5 years' experience with ALC and knowledge of systems services.
- **CICS PROGRAMMER**
  3 - 5 years' experience with ALC. Design experience preferable.

We offer exceptional salaries, unusually generous benefits, reward for individual initiative and drive, and great personal and professional gain as a member of our internationally acclaimed staff of specialists. For immediate and confidential consideration, please forward your resume, to: **COMPUTER ASSOCIATES INTERNATIONAL, INC., 8300 Greensboro Drive, Dept. CW, McLean, Virginia 22102.**

COMPUTER ASSOCIATES
Software superior by design.

An Equal Opportunity Employer M/F/V/H
Applicants Only Need Apply

Computer Professionals
Systems Programmers
Analysts and
Program Analysts

FOX-MORRIS
TECHNICAL CENTER

COAST - TO - COAST

- SYS. SALES PC's	$50-60 based +
- MVS/VM Sys Prog (1 yr min. exp)	$26-43K
- CICS Sys Prog (2 yrs OS/MVS or DOS/VSE)	$27-40K
- IMS DB/DC (Prog/Anal 1 yr)	$24-34K
- CICS or IDMS prog/analyst (2 yrs MVS)	$25-35K
- PC Howe & Sftwr exp (pref. APPLEMAC)	$25-47K
- Burr prog/anal (2 yrs mfg or fin)	$25-30K
- Sys/Ana (2 yrs COBOL/MSA)	$28-39K
- Sys 36/38 MAPICS	To $39K
- DEC VAX/VMS/MANUF	$25-40K
- P/As, DBAs, (IDMS, IMS, ADABAS/ NATURAL, ADR/DATACOM)	To $47K

CONTACT RON DOERFLER
All fees paid - Relocation Assistance
(Call Collect)

fox·morris

212 S. Tryon St./Suite 1350
Charlotte, N.C. 28281
(704) 375-0600

ATLANTA

Southeast/Southwest

If you are seeking career advancement in the data processing profession, then talk to us. We are former computer professionals who have counselled and placed hundreds of computer professionals like yourself in the 17 years since our founding in 1970. To inquire about numerous Atlanta, Dallas, Southeast and Southwest opportunities, send your resume or call us today! **DataPro Personnel Consultants, 400 Perimeter Center Terrace-Suite 650, Atlanta GA 30346. (404) 392-4242, or 12720 Hillcrest - Suite 520, Dallas TX 75230. (214) 661-8600**

DataPro — Member of National Computer Associates

DALLAS

Assistant in Computer Instruction, Resources, and Operations
University of Florida College of Law
Legal Information Center

Responsibilities: Coordinate the computer activities of the law school, including teaching the use of software, hardware, and on-line services; serve as liaison with state computer center; supervise equipment operation; assist and advise administrators in planning for expansion of the program, including new equipment, replacements, and implementing local area networking system; work closely with faculty, staff, and students; investigate and identify computer equipment and software failures and institute remedial procedures; perform minor repair functions. **Qualifications:** B.S. in Computer Science or equivalent hours earned in Computer Science; J.D. preferred but not required; graduate degree, experience, or documented interest in computer science is highly desirable; ability to instruct in use of computer resources and interact effectively with faculty, patrons, staff, and administration required. **Salary:** $25,000 for twelve (12) months; available July 1, 1987. Send letter of application and resume postmarked by May 27, 1987 to:

Ms. Pamela Williams, Chair
Search Committee, University of Florida College of Law, Legal Information Center
Gainesville, FL 32611. AA/EOE.

PROGRAMMERS
SYS 36 & ACCOUNTING
$40,000

Financial application oriented indiv to handle 1 person Dept in Sys 36 environment. Excl communications as well as report generations knowl. Beautiful loc.

ROBERT HALF OF NEW YORK, Inc.
522 Fifth Avenue
New York, NY 10036
212-221-6500

Major NYC agency seeks responsible personnel to assume important computer positions in lower Manhattan.

Computer Programmer Sperry 1100-72 environment. Cobol exp req. Exp with TIP, DPSs, and DMS desirable.

Computer Specialist Macro-11 and exp writing/modifying PDP-11 device drivers required. RSX-IM+ and C desired. Position involves migration of custom written operating system to new hardware.

Requirements for both positions B.A. Degree and 4 yrs f.t. paid computer software exp.

Computer Operator UNISYS 1100 environment. 1 yr exp on UNISYS 1100 console required. Requirements high school or equivalency diploma and 4 yrs full time paid experience. NYC residency required.

Qualified candidates should send resumes to: Personnel, PO Box 404857, Brooklyn, New York 11240-4857. EEO M/F/H

COMPUTER ENGINEER - Design hardware/main board circuit of PC using micro processor and electronic circuit to perform various functions; Develop software package especially for chemical company using BASIC, DATA BASE, ASSEMBLY for IBM PC-XT/AT; Assemble, repair and maintain PC such as Suntech ST 88X, ST 286A, IBM PC/-XT, IBM PC/AT. Requirements: Bachelor of Engineering or Computer Information Engineering, 2 years experience. Salary $29,000/yr, 40 hrs/wk. Mail resume to NYS Job Service 97-45 Queens Blvd., Rego Park, New York 11374. Refer to Job Order #NY-8012403 D.O.T. code 020.062.010

NJECN

DIRECTOR OF MARKETING & PRODUCT DEVELOPMENT

The New Jersey Educational Computer Network (NJECN) is seeking a highly qualified individual to serve as Director of Marketing & Product Development. NJECN is a not-for-profit corporation of public and private institutions of higher education providing computer-related services to higher education, State government and private concerns. The current annual budget for the Network is $7 million.

The successful candidate should be a results-oriented individual possessing strong interpersonal communications, marketing and product development skills, with a demonstrated ability to develop oral, printed and visual presentations of Network services across many media.

Reporting to the Network's Executive Director, candidates should possess Bachelor's degree; Master's preferred, Ph.D. a plus, with four to six years of data processing management experience in higher education or State government. Knowledge of a broad range of computer applications, including micros, minis, and mainframes is desirable. Salary is competitive, with excellent benefits, and is negotiable depending on qualifications. Applications or nominations, including resume, salary history and requirements, should be sent no later than June 1, 1987 to:

Human Resources Manager
New Jersey Educational Computer Network, Inc.
3900 Park Avenue, Edison, New Jersey 08820

AN EQUAL EMPLOYMENT OPPORTUNITY, AFFIRMATIVE ACTION EMPLOYER, M/F

Software Engineer
Will develop end-user application software for systems such as Xenix/Unix to perform user interface and systems/network administrative functions. Design, code and test software modules and systems using high level language such as C and assembly language. MSCS/MSEE or equiv. $2,650/-mo. Job Site: Hillsboro, OR. Clip this ad and send with resume to Employment Division; Attn: Job Order No. 2120338, 875 Union Street, NE, Rm 203; Salem, OR 97311.

PROGRAMMER/ANALYSTS

North Carolina division of a rapidly growing consulting firm needs professionals with 3 or more years experience for Charlotte, NC assignments. Company paid benefits including profit sharing and resort condominium usage. Skills required are:

- IMS DB/DC
- HOGAN/DDA
- DEC/VAX, FORTRAN
- IDMS/ADSO

Send resumes to:

METRO
Information Services, Inc.
Attn: Kathy Beebe, Dept. C
Seven Parkway Plaza, Ste 140
Charlotte, NC 28217

Project Leader, Systems Analysis to plan, organize & control specific assigned projects involving maintenance or enhancement of existing systems, or development of new systems. Coordinate & supervise development, implementation, & support of efficient & fully operational application programs, and the preparation of associated documentation. Req's BA in Comp. Sci. or equivalent (may be another professional major field such as business, engineering, chemistry or math) + 4 yrs exp, with a minimum of 2 yrs at Project Leader level. Must have good working knowledge of COBOL, Assembler, systems design & analysis techniques, on-line systems design, D Base II & III, Lotus, & Multiplan. Sal: $46,500/yr. Job site/interview: Los Angeles. Send this ad and your resume to: P.O. Box #9560, Sacramento, CA 95823-0560 Job #CR4481 no later than June 2, 1987

PROGRAMMERS
TENNESSEE

Requirements include OS, banking, COBOL and/or Assembler; CICS C.L. a plus. Relocation and fee paid. Salary to $30,000.00. Please contact Mike Denison:

2720 Stemmons Frwy., 1207C
Dallas, TX 75207. (214) 637-6360

DATA PROCESSING CAREERS

SYSTEMS ANALYST

International investment consulting firm for large pension plan sponsors and institutional investors seeks a key individual for expansion of its professional systems development staff. We are looking for someone with 3 to 4 years experience in the analysis, design and programming of large information systems. Bank Trust or securities experience preferred, and interest in institutional investment applications is required. The successful candidate should have demonstrated ability to manage a DP project from inception through implementation; excellent interpersonal skills a must. A combination of BS degree in Computer Science and an MBA is preferred. If you are interested in a professional career in a rapidly growing financial field, send your resume in confidence to: Human Resources Dept., Frank Russell Company, P.O. Box 1616, Tacoma, WA 98401. EOE.

EDP OPPORTUNITIES

SOUTHEAST U.S.

If you have 2 + yrs. exp. in Programming, Analysis,Technical Support, or Data Base on the following equipment, WE NEED TO TALK.

- **IBM, OS/MVS/XA** (Paul Reid)
- **HP3000** (Louis Lemone)
- **IBM System 38** (Chris Blair) (Rosemary Lemone)

Specializing only in Data Processing for over ten years with a staff of four recruiters - please send us your resume or call TODAY!

VIP Personnel Services
P.O. Box 2851
Durham, NC 27705-0851
(919) 471-6404

MIS PROFESSIONALS

The Interface Group, Inc., the world's largest independent producer of conferences and expositions, is adding professional staff to the corporate MIS group at our world headquarters.

We have opportunities for:

PROGRAMMER ANALYSTS

OFFICE AUTOMATION COORDINATOR

PROJECT LEADERS

P.L.'s & Analysts will be responsible for converting divisional systems to a new HP 3000 environment and leading the way in the design, development and implementation of new corporate systems. Both areas require applications development expertise using COBOL, IMAGE & VIEW and the appropriate education.

The OA Coordinator must be well versed in MS-DOS, Multimate and LOTUS and have the ability to educate non-technical users. Primary responsibility is corporate PC-user support, including H/W & S/W evaluation, selection and maintenance.

We offer excellent company-paid benefits and other incentives. If you have expertise in any of the above areas along with 2 to 5 years' experience, send your resume and salary requirements to Bill Wimer, Director of MIS, care of the address below.

THE INTERFACE GROUP, Inc.

World's Leading Independent Producer of Conferences and Expositions

300 First Avenue • Needham, MA 02194

An Equal Opportunity Employer M/F

DATA PROCESSING PROFESSIONALS

If you want to accelerate your drive toward success in the field of data processing, you should consider the opportunities available now at BROADWAY & SEYMOUR, INC., the South's largest software consulting company.

Our offices in RALEIGH and CHARLOTTE, N.C. continue to expand and invite you to take advantage of these opportunities:

CHARLOTTE OPENINGS:

- **Programmer Analyst with Assembly experience**
- **Programmer Analyst with 4700 FCL experience**
- **MVS Systems Programmer**
- **Software Technical Writers**
- **Account Manager**
- **Banking Software Installation Consultant**
- **Programmer Analyst with MSA experience**
- **Sr. Systems Analyst with Data General and AOS/VS experience**
- **Technical Instructor with CICS experience**

RALEIGH OPENINGS:

- **Programmer Analyst with IBM mainframe and System 36 experience. RPG, COBOL, MVS, CICS required.**
- **Programmer Analyst with IBM mainframe, MVS, COBOL and CICS experience required. Assembler and database experience a plus.**
- **Programmer Analyst with state government experience**

We offer a competitive salary and a comprehensive company paid benefits package to include medical and dental, long-term disability and life insurance. For immediate and confidential consideration, call or write TODAY, to:

Fred Brillante
Director of Human Resources
(704) 375-4700

Broadway & Seymour, Inc.
Information Systems and Services
302 S. Tryon Street, Charlotte, NC 28202

HOGAN – ODS

We are installing a full array of HOGAN integrated banking software products including ODS and ILP.

ODS experience required:

- **Planning**
- **Coding (Assembler and/or Cobol)**
- **Implementation**
- **ODS Application interface writing**
- **Device driver writing**

(we will be using ISC equipment)

We offer competitive salary and excellent benefits package including Medical, Dental and a 401(k) Plan. Send resume to:

PERSONNEL DEPARTMENT
ASTORIA FEDERAL SAVINGS
37-16 30th Avenue
Astoria, N.Y. 11103
An Equal Opportunity Employer

The University of Iowa

Publications/Word Processing Support

The Weeg Computing Center provides and supports instructional and research computing for The University of Iowa academic community. The center operates an IBM 4381, a network of Prime systems, a VAX 11/780, and supports a large community of personal computer users.

We are seeking applicants for a manager for the Office Support and Publications Group. Office Support staff provide word processing support on personal computers and mainframes for the faculty, staff, and students. Publications staff are responsible for the production of user documentation, newsletters, and brochures. You must have a master's degree or an equivalent combination of education and related experience, considerable management experience, computing experience, and excellent interpersonal skills. Experience with writing, editing, word processing systems, consulting, and personal computers is desirable. Initial screening of applicants begins June 1. Salary range $30-37,000.

The University of Iowa is a major research and PhD-granting institution located in Iowa City. It combines the advantages of life in a small, midwestern city with rich and varied cultural opportunities. A first class performing arts program, major college sports, and many recreational opportunities abound. The public school system is one of the state's best.

Please send application letter and resume to:

Linda Boyatzies
Weeg Computing Center
The University of Iowa
Iowa City, Iowa 52242

The University of Iowa is an Affirmative Action, Equal Opportunity Employer.

The best in the Sunbelt

Programmers —Contract Assignments— $20-24/Hr.+

Jr. to Sr. level programmers with 1+ yrs. exp. in IBM & other languages (PASCAL, "C," ASSEMBLER, PL-1, etc.). Contract assignments 12 mos. +. $20-24/hr. + benefits package.

In confidence, contact Al Madsen, CEC.

CORPORATE PERSONNEL CONSULTANTS, INC.
3705 Latrobe Drive, Suite 310
Charlotte, NC 28211
(704) 366-1800

PROGRAMMER ANALYSTS

Relocation Expenses

- IDMS ADS/O
- ADABAS CICS
- CICS Systems
- DEC VAX BASIC
- HP POWERHOUSE
- IMS DB/DC
- ADABAS/NATURAL
- DEC VAX C
- IDMS DBA
- CICS/DL1
- ADA
- GMAP IDSII
- MOD 204 DBA

Send resumes to: John O'Brien

A&B Personnel
122 Bremer Building
St. Paul, MN 55101
(612) 292 8519

Progressive quality community college located in Oregon's mid-Willamette valley is seeking qualified applicants for the **Director of College Computer Services** for **Linn-Benton Community College**. Responsible for planning and system analysis and overall management of computing services. Requires: BS degree in related discipline, advanced degree preferred; minimum of five years experience in management of large data base systems. Application deadline: 5:00 p.m., May 30, 1987. Request LBCC application and submit to the Human Resources Office, (503) 967-6502, LBCC, CC-108C, 6500 S.W. Pacific Blvd., Albany, OR 97321. EOE.

systems analyst

Outstanding position in Chicago as an Analyst to design systems for new applications. Excellent salary. Some IBM System 38 experience as a programmer or analyst required. Send resume in confidence to:

CW-84917
Computerworld
Box 9171
Framingham, MA 01701-9171

SYSTEMS ANALYST - Analyze, design, develop & implement an on-line data base oriented Policy Management System using advanced data communication features. Responsible for conversion from existing system to newly developed system; maintenance & training of end users. 3 yrs exp. or 3 yrs related programming exp. Requirements: At least a Bachelor's in Comp. Sci. Must know COMS, ALGOL, SDF, DMS II & COBOL on Burroughs version 3.5 onwards. Must know Burroughs A series 6900/6700 mainframe and minicomputers. Salary: $38,000/yr. 40 hr wk. Send resume to: Donald J. Fager & Assoc., Inc., 2 Park Ave, New York, NY 10016. Attn: Mr. Snow.

Data Processing Opportunities

Imperial Corporation of America, parent company of Imperial Savings, is a progressive leader in the financial services industry. We recognize and reward individuals who are results and goal-oriented, and continue our commitment to employee growth and development. Our Management is committed to the idea that Data Processing needs are integral to the continued growth and success of the corporation. We currently have the following opportunities available at our San Diego headquarters:

Senior Programmer Analyst

Utilize your skills to design, develop and support new and existing systems, subsystems and programs. Prepare system proposals and program specifications, while responding to user requests, inquiries and problems. Knowledge of the following is essential: IBM Assembler, COBOL, CICS macro level, OS JCL, Batch and online debugging experience.

Data Base Analyst

Your responsibilities will involve performing corporate data flow analysis and gathering, analyzing and documenting data elements. You will also be involved in generating DBD's, PSB's, ACB's and physical DB definitions. This challenging position requires 5 years' data analysis experience in an IMS/DB/CICS environment.

Systems Programmer

In this position, you will have responsibility for installing, maintaining, configuring and troubleshooting our MVS/XA systems. You will also provide primary support for MVS/XA subsystems and secondary support for the VM/XA system. To be successful, you should have 4-6 years' experience in MVS/XA systems programming along with experience using systems programming tools and performance tuning for complex-wide systems.

ICA offers a competitive salary, and a comprehensive benefits package along with the opportunity for career growth. Please send your resume with salary history, indicating position of interest, to: **Imperial Corporation of America, Employment, P.O. Box 23036-CNC, San Diego, CA 92123**

We are an equal opportunity employer

ICA IMPERIAL CORPORATION OF AMERICA AND SUBSIDIARIES

On-Line Software International, Inc.

Let's meet in New York and talk about your future in New Jersey. On-Line Software is holding an:

OPEN HOUSE

at the Warwick Hotel, 2nd Floor
65 West 54th St. (at Avenue of the Americas) NYC.
Wednesday, May 20, 4:30 p.m. - 8 p.m.

Meet us there, and we'll tell you all about the exceptional opportunities available at our Fort Lee Corporate Headquarters. If you're a pro who has the expertise to increase our market share we'd like to meet with you!

On-Line Software, a recognized leader in the highly competitive computer software products industry, continues to grow at an impressive rate.

Our headquarters, only two minutes west of the George Washington Bridge, has these openings in:

SOFTWARE SALES
Telemarketing/Direct Sales

Attractive base salary and aggressive commission plan. Comprehensive benefits plan which includes: Dental, Prescriptions, and 401(k).

Responsibilities include: Telemarketing our products, setting up product trials, soliciting customers, meeting sales quotas. The Open House is being held in New York City for the convenience of the applicant, but if you are unable to attend, please send your resume or call our Corporate Headquarters, Fran Smith, Director of Human Resources.
Outside New Jersey, call toll-free (800) 526-0272, ext. 2425.
In New Jersey, (201) 592-0009, ext. 2425.

On-Line Software International, Inc. | Two Executive Drive, Fort Lee, NJ 07024 | An Equal Opportunity Employer m/f/h/v

Vice President Information Systems

Multi-Hospital System

Position:

Responsible for all computer-based information systems and services, IBM focused, including stand alone; in-house mini, mainframe and network information systems; and time shared processes.

Candidate:

A seasoned executive with not less than 10 years of data processing information systems work, of which at least the last 5 have been in a hospital system having more than 350 beds. Demonstrated ability to develop, plan, manage and complete projects is required, with communication skills matching. Bachelor's degree required, Master's or advanced degree in Engineering, Computer Science, Math or Business Preparation will be advantageous.

Hospital:

We are a two-hospital acute care system with ancillary activities in medical and related services. We are not rebuilding or turning around, rather continuing a 25 year record of service to a medically sophisticated community. Information about our System can be provided, and our reputation may be verified through your medical sources.

Contact David G. Gyongyos, Director, Human Resources, Scottsdale Memorial Health Systems, Inc., 7220 E. Osborn Rd., Scottsdale, AZ 85251. EOE.

SCOTTSDALE MEMORIAL HEALTH SYSTEMS, INC.

PROGRAMMERS/ CONSULTANTS

4-year contract

(7) MEDICAID $104,000

New Systems development. Excellent location, management opportunity.

(12) PROGRAMMER/ ANALYST..... $72,800

(3) PROGRAMMER ANALYST..... $68,640
Dbase III

Call Rick Wilson 617-648-7559 for details or send resume to:

LENCO
Computer Consulting

661 Mass. Ave., Suite 25
Arlington, MA 02174

APPLICATIONS ANALYST

Digi-Key Corporation is seeking an ambitious, aggressive individual with extensive exposure to assembly language. In depth knowledge of computer hardware is desirable as is experience programming concurrent processes in a real time environment. A master's degree in electrical engineering or computer science is preferred, but motivated individuals with a bachelor's degree would be considered. Exposure to Perkin-Elmer/Concurrent computer systems is a real plus. A salary in the range of $35,000 to $50,000 depending on education and experience, three weeks of paid vacation, plus an excellent benefits package are offered for your service.

Digi-Key is a rapidly expanding mail order distributor of electronic components serving a national market since 1972. We are located in northwestern Minnesota near excellent recreational opportunities including fishing, big game hunting, skiing, snowmobiling, and much more. Our town is large enough to provide a good educational system and cultural opportunities yet small enough to offer a rural lifestyle.

DIGI-KEY CORPORATION
Keith Steva
701 Brooks Ave. South
Thief River Falls, MN 56701
Phone: 800-344-4539

D.P. Professionals

- Analysts
- Programmers
- Operators
- D. B. Designers
- S/W Engineers
- Documentation
- Telecommunications

Part-Time/Full-Time

★ TOP RATES ★ LOCAL/NATIONAL
★ NEW PROJECTS ★ LONG/SHORT TERM
★ WEEKLY PAY ★ BEST SELECTION

A phone call to any office will update you on career OPTIONS and BENEFITS. Explore the best CONTRACT assignments and enjoy EXPERT treatment.

One Washington St.
Wellesley, MA 02181
617-237-1777

6311 Rockside Rd - Square II
Independence, OH 44131
216-642-3840

6911 Richmond Hwy.
Alexandria, VA 22306
703-765-8900

4401 Tradewinds Ave.
Lauderdale-by-the-Sea, FL
305-776-5300

The Experts

THE CAROLINAS! A Great Place to Live!

All Fee Pd

IBM S/A	$35-50K
IBM P/A	$30-45K
BURROUGHS	$30-45K
DBA's	$30-40K
IBM Sys/38	$28-35K
IBM Sys/36	$25-35K

100s more . . . Call Us.

REGENCY
Personnel Consultants
Randy Paul (919) 373-1991
823 N. Elm, Greensboro, N.C. 27401
Member Firm
computer/net
national placement network

INDEPENDENT CONSULTANTS CONTRACTORS

Southeast Locations

* FOCUS
* CICS BC/BS
* Bar Coding
* IMS DB/DC
* MSA (All)
* IDMS/ADSO
* ORACLE
* Series 1

Call or Send Resume

DP PROS, INC.
P.O. BOX 1815
BURLINGTON, NC 27216-1815
(919) 222-8030

DATA BASE MANAGER, HYDROLOGY

- Manage the implementation, maintenance, and research related to a large corporate hydrologic data base. This includes supervision of both engineers and programmers in data base design, system level computer processes, and engineering applications. A thorough foundation is expected in both Water Resource Engineering and in Computer Science relating to data base management techniques, A.I., advanced graphic interactions, interfacing computer hardware, hydrology, hydraulics, error detection, and modeling applications. Minimum requirements are a Bachelors degree in appropriate field(s) and over four years of responsible experience or an equivalent combination of training and experience. Salary range $29,037 - $45,677. For an official application contact the **South Florida Water Management District, P.O. Box 24680, West Palm Beach, FL 33416-4680 or call 305/686-8800, ext. 725.** An official application must be received by the Personnel Office no later than 5:00 pm on June 20, 1987. Equal Opportunity Employer.

PROGRAMMER/ ANALYST

Brockway

At Brockway's Corporate Headquarters located in Jacksonville, Florida, you'll find the best in professional and personal satisfaction.

As part of the Corporate MIS Department, you will perform applications and programming responsibilities for the Company's various divisions and subsidiaries including implementation and support of corporate applications software.

To receive consideration, you must possess a Bachelor's degree in Business/Computer Science or equivalent, with previous IDMS programming experience. CICS is desirable but not required.

Brockway Inc., is a growth-oriented Fortune 500 packaging leader. We offer attractive salaries and competitive benefits. For confidential consideration please forward your resume and salary requirements in confidence to:

Personnel Manager—Corporate Headquarters

BROCKWAY, INC.

One Enterprise Center, 225 Water Street
Department 65
Jacksonville, FL 32202

An Equal Opportunity Employer

INSTRUCTOR, DATA PROCESSING

Qualifications:
Bachelors Degree (preferably a Master's) with major in teaching field and two-years related occupational experience.

Application Deadline:
5:00 p.m., June 1, 1987

Apply to:
Personnel Office
New River Community College
Drawer 1127, Dublin, VA 24084

EQUAL OPPORTUNITY/
AFFIRMATIVE ACTION EMPLOYER

San Francisco CONSULTING OPPORTUNITIES

GW Consulting is currently recruiting D.P. Professionals for subcontract positions in the San Francisco Bay Area. Specific requirements include:

- IDMS ADS-O
- TANDEM
- SETI TRUST
- AUTOMATED FINANCIAL SYSTEMS (Loan Systems)

Compensation package includes 401K and Profit Sharing.

Please call or send a resume for immediate consideration to:

GW Consulting
507 Howard St., 2nd Flr
San Francisco, CA 94105
(415) 896-5566
Attn: Sharon Collier

SYSTEMS ANALYST/PROGRAMMER - Design and apply statistical applications to describe and forecast psychometric properties of licensing and certification examinations. Design formatted reports of scores, statistical analyses and work logs. Design & maintain specialized programs in "C" language within a UNIX operating system on a mainframe computer. Must know "C", and UNIX, must have background in statistics, Req: Master's - Comp. Sci. Pays: $30,400/yr, 35 hr wk. Mail resume to: NYS Job Service, J.O. # NY80186I9, 250 Schermerhorn St., 3rd Floor, Brooklyn, NY 11201. DOT - 012.167-066.

Software Engineer responsible for design and development of an integrated FORTH Operating System to run on a special purpose "Remote Test Computer." Requirements: MS Computer Science, strong theoretical background in operating system algorithms, knowledge of Multitasking FORTH internals, integrating device drivers in FORTH, VAX/VMS C, MS-DOS. $34K/yr. Place of employment and interviews: Walnut Creek, CA. Job Site: Walnut Creek. Send this ad and a resume to Job Order #WS 4671, P.O. Box 9560, Sacramento, CA 95823-0560 no later than June 2, 1987. EOE.

CLASSIFIED ADVERTISING ORDER FORM

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Employment Today and Buy/Sell/Swap. (Available upon request: Software Wanted, Real Estate, and others).

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines. Any special artwork should be enclosed with your ad also. Logos must be submitted on white bond paper for best reproduction.

Cost: Our rates are $176.40 per column inch. (Each column is 1 13/16") Minimum size is two column inches (1 13/16" wide by 2" deep) and costs $352.80 per insertion. Extra space is available/and billed in half-inch increments and costs $88.20. Box numbers are $15.00 extra per insertion.

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE, or a Purchase Order Number. Any extensions on this policy must be made through our Credit Department.

Ad size desired:
_____ columns wide by _____ inches deep.
Issue Date(s): _____
Section: _____
Name: _____
Company: _____
Title: _____
Address: _____
_____
Telephone: _____

Send this form to:

COMPUTERWORLD CLASSIFIED ADVERTISING
375 Cochituate Road, Box 9171
Framingham, MA 01701-9171

Telecopier service is available.

Call: 800-343-6474 or 617-879-0700
extension 410 or 451

THE UNIVERSITY OF FLORIDA

ASSOCIATE VICE PRESIDENT FOR TELECOMMUNICATIONS

The University of Florida is seeking applicants and nominations for a newly-created position in its central administration, Associate Vice President for Academic Affairs for Telecommunications.

The person in this position will be responsible for providing the leadership necessary to bring the University to the forefront in telecommunication and local networking services in support of research and education programs. Major responsibilities include: developing and implementing a long-range plan for telecommunications and networking; managing a major study to develop and implement an integrated metropolitan area network; and supervising and coordinating the activities of two major computer centers which provide academic and administrative computing services to the University and region. Ancillary duties include the direction and supervision of telecommunications and network personnel, serving as the Information Resource Manager for the University and as the Institutional Representative to BITNET.

Qualifications for this position include: a minimum of three years successful experience in management of telecommunications and data networking in a higher education environment for research and education programs; a Ph.D. or equivalent experience (a master's degree in an appropriate discipline is a minimal requirement); a vision for future telecommunications development in higher education; an understanding of telecommunications and networking in heterogeneous environments; a sensitivity to the needs of end users; superior leadership and organizational skills; and excellent communication skills, both written and oral.

This position will be available as of September 1, 1987, but the starting date is negotiable. The salary is negotiable based upon degree and experience.

Nominations, applications, and inquiries must be submitted on or before July 31, 1987, with resumes and the names of three references to:

Dr. Jeaninne Webb, Chairman, Search and Screen Committee,
1012J Turlington Hall, University of Florida, Gainesville, Florida 32611

The search will be conducted under Florida's "Government in the Sunshine" law. The University of Florida is an Equal Employment Opportunity Affirmative Action Employer.

Programmer Analyst

(Coordinator Of Academic Computing)

Support experience with a large scale mainframe computer system required. Unisys (Burroughs) large scale computer experience is preferred. Support, maintain, evaluate and develop software for student instruction and faculty research. Minimum of 2 years computer experience using a high level language and statistical programs (for example SPSS, SAS) is required. Demonstrated verbal communication skills. Minimum Bachelor Degree in Computer Science or degree with computer experience. Send resume and letter of application, transcript, 3 letters of recommendation by July 1st, 1987 to: **Dr. Robert Pierce, Chairman Search Committee, Computer Center, PO Box 2000, Cortland, New York 13045.**

The College Of Cortland is an Equal Opportunity Employer

UNISYS 1100

Dunhill of Cherry Hills is searching for UNISYS 1100 professionals. If you have experience in DMS, TIP, MAPPER, COBOL, FORTRAN, Internals or Communications and are interested in pursuing new opportunities nationwide send your resume in confidence to

Mike Badgett
Dunhill of Cherry Hills
2950 S. Jamaica Crt., Ste. 300
Aurora, CO 80014
(303) 755-5500

Or call our toll free #
1-800-426-2468 ext. 70690
NATIONAL UNISYS RECRUITERS

WHY COMPUTERWORLD IS #1 WITH COMPUTER PROFESSIONALS EVERYWHERE.

COMPUTERWORLD brings you the latest news. Every week. So you can keep up . . . or get ahead.

SPOTLIGHT, the handy new pull-out section highlights new products — with surveys of key vendors, prices, features, and more. So you can make the best buying decisions. The most confident recommendations.

Plus, Computerworld Focus for in-depth analysis. Each monthly issue focuses on a timely topic. So you can anticipate developments. Spot trends. Keep current.

Get all three. To subscribe, complete the order form and mail in this postage-paid envelope or call 1-800-544-3712*.

* In PA call collect 215-768-0388.

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55 SOUTHEASTERN, PA 19398

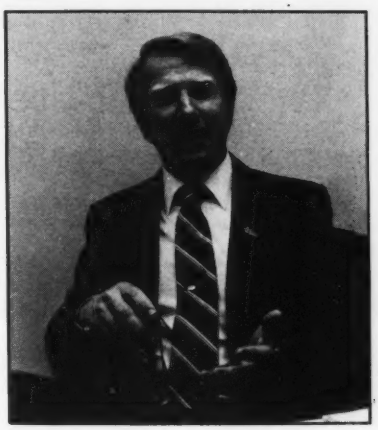
POSTAGE WILL BE PAID BY

CIRCULATION DEPARTMENT

COMPUTERWORLD

P.O. BOX 1016
SOUTHEASTERN, PA 19398-9984

"We filled 75% of the positions with responses from our first ad in Computerworld."



Bjorn Nordemo
Vice President
Data Arts & Sciences, Inc.
Weston, MA

Bjorn Nordemo is Vice President of Data Arts & Sciences, Inc. (DASI), a contract software agency based in Weston, MA. Although they place people in permanent positions, DASI most often places 'contract programming personnel' — consultants who fit special niches for short or long term commitments in corporations in the New England area.

"Our agency specializes in finding computer consultants — designers of systems, evaluators of hardware and software requirements, and computer programmers to mention a few. We recently were introduced to Computerworld as a potential source for finding these consultants," states Bjorn. *"I liked the idea because I know Computerworld has a broad reach — from MIS/DP directors to computer programmers, in multiple industries and multiple markets — and that's what DASI needs."*

"We had four specific positions for MIS/DP consultants that we needed to fill in northern New England. We used the local newspaper on a weekly basis, but people who are willing to move usually aren't reading the local Sunday paper. So, I felt this was a perfect opportunity to try Computerworld," says Bjorn.

According to Bjorn, he's quite satisfied with the results. *"From Computerworld, we filled 75% (3 out of 4) of the positions with the responses from the first week, and the remaining position with the response from the following week. These results alone made my ads in Computerworld worthwhile."*

And Bjorn also recognizes a second benefit to advertising in Computerworld. *"The beauty of using Computerworld is that it's read by people in the computer industry who have a need for consultants, as well as being read by consultants who need to keep up to date on the marketplace,"* says Bjorn. *"So we not only reach qualified candidates to fill our current openings, but we are creating awareness of the services that DASI has to offer,"* says Bjorn.

"We have some great plans for expansion and as we do, Computerworld is going to play a strong hand in helping us accomplish our goals," concludes Bjorn.

Computerworld. We're helping employers and top professionals get together in the computer community. Every week. Just ask Bjorn.

For all the facts, call your local Computerworld Recruitment Advertising Sales representative.

COMPUTERWORLD

Sales Offices

BOSTON: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

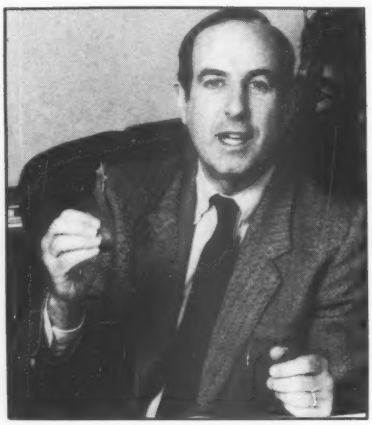
NEW YORK: Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652, (201) 967-1350

CHICAGO: 2600 South River Road, Suite 304, Des Plaines, IL 60018, (312) 827-4433

LOS ANGELES: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164

SAN FRANCISCO: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (415) 322-3314

"...Computerworld has proved to be one of the most effective media for reaching our high-tech target groups."



— Michael Gill
Senior Vice President/
Creative Director
Thompson Recruitment Advertising

Michael Gill is Senior Vice President and Creative Director of Thompson Recruitment Advertising, based in Los Angeles, California. In 1986, Thompson won more EMA awards than its three largest national competitors— combined. The company's advertising goal is a simple but demandiing one: To create the most effective recruitment advertising in the marketplace.

Thompson can point to many reasons for its success. And one of the first that comes to mind, Michael says, is Computerworld and its Employment Today section.

"Today's job market continues to change rapidly. It's no longer enough to merely post a job and hope that people will come running. This new competitive marketplace demands that we use many new approaches and do a lot more research. Simple demographics just aren't enough any more. Fortunately, Computerworld understands this need for research that goes beyond numbers alone.

"For us, Computerworld has proved to be one of the most effective media for reaching our high-tech target groups. We've discovered that it is must-reading for many of the high achievers that our clients want to attract.

"In fact, we recommend Computerworld to our clients because we know that it will reach prospects most effectively. Among other benefits is the quality of the publication itself, which reinforces the quality of our campaigns.

"The successful recruiter knows that today's marketplace is highly competitive, and that tomorrow's marketplace will be even more so. At Thompson, we expect that tomorrow, as today, Computerworld will be an invaluable ally in helping us to achieve our mission of creating the most effective recruitment advertising in the marketplace."

Computerworld. We're helping employers and top professionals get together in the computer community. Every week. Just ask Michael.

For all the facts on how Computerworld can put you in touch with qualified personnel, call your local Computerworld Recruitment Advertising sales representative.

COMPUTERWORLD

Sales Offices

BOSTON: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

NEW YORK: Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652, (201) 967-1350

CHICAGO: 2600 South River Road, Suite 304, Des Plaines, IL 60018, (312) 827-4433

LOS ANGELES: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (714) 250-0164

SAN FRANCISCO: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714, (415) 322-3314

BUY SELL SWAP

DEC
IBM
DG

New & Used Computers

(305) 392-2005
TELEX 156 1249

thomas business systems, inc.

4301 OAK CIRCLE • UNIT 11 • BOCA RATON, FL 33431

The Dana Deal. It'll blow you away.

When you buy, sell or lease a 36, 38 or 43XX—discover how Dana Deals. Quickly. Reliably. With expert service and installation. Experience the Dana Deal. Just pick up the phone. Call **(800) 433-4148** outside California. And fasten your seatbelt.

LOS ANGELES, CA (213) 212-3111
DALLAS, TX (214) 248-8588
STAMFORD, CT (203) 359-8040
COLUMBUS, OH (614) 899-0204

Dana MARKETING

IBM UNIT RECORD EQUIPMENT
DISK PACKS—DATA MODULES—MAG TAPE—DISKETTES

SALE OR LEASE

IBM UNIT RECORD MACHINES
026—029—082—083—084
085—087—088—129—514
519 – 548 – 557 – 188

NEW & USED DISK PACKS—DATA MODULES
2316—3336(1)—3336(11)—3348(70)

MAG. TAPE-DISKETTES
Every Item Guaranteed

Highest Prices Paid for Used Packs & Modules

THOMAS COMPUTER CORPORATION
5633 W. Howard St. Chicago, IL 60648
800-621-3906 (IL-312-647-0880)

maybe

YOU NEED 34, 36, 38,4331-4381, SERIES 1
YOU NEED CRT'S, PRINTERS, DISKS, TAPES
YOU NEED A QUICK PRICE QUOTATION
YOU NEED TO UPGRADE
YOU NEED TO CONSIDER LEASING
YOU ARE TIRED OF WAITING
YOU NEED TO CALL US

WE BUY • SELL • LEASE
34 • 36 • 38 • SERIES 1 • 4331-4381
ALL PERIPHERAL EQUIPMENT
ALL UPGRADES

CALL: 800-238-6405
IN TN: 901-372-2622
IN NC: 919-884-0879

CB

COMPUTER BROKERS INC.
2978 SHELBY ST.
MEMPHIS, TN 38134
"SINCE 1974"

1-800-426-USED
In California (714) 641-0366

IF IBM MAKES IT, WE CAN SAVE YOU MONEY

Series/1
System/34
System/36
System/38
43 XX
30 XX

- *Top Savings*
- *Quick Delivery*
- *Short and Long-Term Leases*
- *All Models & Peripherals*
- *New & Used*

M&A

Marshall Lewis
& Associates, Inc.

CDLA Member Computer Dealers & Lessors Association

1536 Brookhollow Drive, Building A
Santa Ana, Ca 92705-5426

IBM BUY · SELL · LEASE

36
4300
38
SERIES 1

- Processors
- Peripherals
- Upgrades

TENNESEE ASSOCIATES
(714) 847-8486

MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services:

Request for Proposal No. 1218, due Monday, June 1, 1987 at 3:30 p.m. for the acquisition of a second CPU license for the Software AG ADABAS family of products for the STATE COMPUTER CENTER. No charge.

Request for Proposal No. 1219, due Monday, June 1, 1987 at 3:30 p.m. for the acquisition of an upgrade for an IBM 3380 technology disk storage subsystem for the Computer Services Division of the UNIVERSITY OF MISSISSIPPI MEDICAL CENTER. No charge.

Request for Proposal No. 1220, due Tuesday, June 2, 1987 at 3:30 p.m. for the acquisition of an upgrade for a Sperry 5000/80 minicomputer for the MISSISSIPPI DEPARTMENT OF CORRECTIONS. No charge.

Detailed specifications may be obtained from the CDPA office by submitting a written request. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Patsy Stanley @ (601) 359-2604 or
Colleen Downing @ (601) 359-2624

IBM SPECIALISTS
SELL • LEASE • BUY

S/34 3741 S/36 S/38 3742

- New and Used
- All Peripherals
- Upgrades and Features
- IBM Maintenance Guaranteed
- Immediate Delivery
- Completely Refurbished

800-251-2670
IN TENNESSEE (615) 847-3011

CMA
COMPUTER MARKETING
of America, Inc.
P.O. BOX 71 • 610 BRYAN STREET • OLD HICKORY, TENNESSEE 37138

AT&T Mobile Phones
$699.00 plus tax
Includes **FREE** standard installation in Massachusetts
Available anywhere in the Continental US
Call TODAY!
ARISTA COMMUNICATIONS
(617) 875-4888

IBM 4300 SYSTEM 36 SYSTEM 38 SERIES 1

MEMBER OF CDLA

• SPECIAL All S/1 4956 XJCPU's — All S/36 B Models/ & Upgrades
• Buy • Sell • Lease • Trade • New • Used
• IBM Warranty/IBM Maintenance Guaranteed
• Disk • Terminals
• Flexible Lease Options Tailored to Your Needs
• Printers • Tape

MEMBER OF WSEL

• Equipment Configured To Your Requirements
• All CPU Upgrades

NEWPORT LEASING, INC.
714/770-2122
2 Faraday,
Irvine, CA 92718

• Buy • Sell • Lease • Rent

IBM. Displaywriters

5525 — OFFICE SYSTEMS
5219 — 5253 — 5258

6670 PRINTERS

SYSTEM/34/36

CDB FINANCIAL, INC.

3520 DILIDO ROAD
DALLAS, TEXAS 75228
214-324-3491

Member CDLA-HONEDA

Inflation Fighters

Quality & Savings

Slightly used, Money Back Guarantee. Full Reels. All External Labels Removed Guaranteed for use at 1600 BPI through 6250 BPI.

2400' Reel **$4.95 ea.**
1200' Reel **$4.50 ea.**
600' Reel **$3.75 ea.**

All Tapes with Hanging Seals

We pay freight on orders over 200 tapes. All orders shipped within 48 hours.

Call or Write

Computer Tape Mart
44A Seabro Avenue
N. Amityville, New York 11701
[516] 842-8512

DEC
BROOKVALE ASSOCIATES

VAX® 8600-Qty 1
VAX® 8650-Qty 1
AVAILABLE FOR IMMEDIATE INSTALLATION

RENT • LEASE • PURCHASE

IN STOCK FOR YOUR INSPECTION

EAST COAST 516-273-7777
WEST COAST 206-392-9878

We Buy & Sell
DEC
Systems Components

Digital Computer Resale

call:713 445-0082
600 Kenrick Ste C22
Houston, Tx 77060

WANTED TO BUY

NAS 9080 64 Meg, 24 Channels Wanted Immediately

FOR SALE

NAS 9040 16 Meg 8 Channels For Immediate Delivery

Contact:
COLDS
(313) 939-7000 Ext. 703
Rick Szarama

AMCA INTERNATIONAL MEMPHIS, TENNESSEE DATA CENTER CLOSEOUT

FOR SUBLEASE
IBM 3725/26

FOR SALE
Misc Data Communications Items
IBM 3033N & 370/158 CPU's
Air Conditioners, Raised Floor, Tape Cabinets, Misc Computer Peripherals & Furniture

All Items Available July thru August 1987

Contact: Ty Weeks or Lynn Shober (901) 372-6464

DISCOUNT IBM SPARE PARTS AVAILABLE FROM TRW

☐ UP TO 80% OFF ☐ MASSIVE INVENTORY
☐ GUARANTEED 24 HOUR DROP SHIP

SPECIAL WHILE QUANTITIES LAST

3350 HDA-5	$ 125
5340 62 PC. Drives	$ 800
3278-II Analogue Cards	$ 150
3420 Mod-8 Capstan Motors	$ 3,400
3420 Mod-6 Capstan Motors	$ 600
5251 Mod-11 Planar Bds	$ 275
3279 Parts	35% OFF LIST
Repairs on 3180 parts	
Planar Boards with exchange	$ 500
CRT-S with exchange	$ 400
Power Supplies and Keyboards with exchange	$ 225

Call for further information on parts available:

1-(800) 426-7727
IN NJ CALL: 1-(201) 334-3377
ASK FOR RICH or DOUG

TRW Recon Services

® TRW Inc. 1987 TRW is the name and mark of TRW Inc. IBM is a Trademark of International Business Machines Corp.

TRW
A Company Called TRW

3704
3705 3725
BUY • SELL • LEASE

Call Toll-Free
800 532-7532
In Minnesota Call 612 829-2800

Centron DPL Company
Member CDLA

Wanted
Prime Computer
Model 9755, 9950
Or 9955 System.

Ideal Configuration: 8 mbytes RAM, 1200 mbytes FM Disk w/2 Controllers, 2 URC's, 1600/6250 Tape Subsystem, System Console, Support 80 Async Terminals.

Will Consider Other Configurations.

Contact Mr. Marks,
SAIC-Technology At
(619) 450-3806

*** D E C**

8650-CDAP
Fully Refurbished By DEC*
List - $528 K
Comes with VMS 4.5 and DecNet
Includes 90 day warranty
Along with factory installation
Ready to ship
CALL FOR SPECIAL PRICING

Time Electronics, Inc.
MA: 617-342-4210
OH: 614-764-2224

* DEC is a Registered Trademark of Digital Equipment Corp.

BURROUGHS
BUY ● SELL ● LEASE
Systems * Processors * Peripherals

- All "A" Series
- All Peripherals
- All Terminals
- All Convergent Technology
- All BX800 & BX900 Series

"May Specials"
B9484-51 206 Disk Drive
B9494-41 207 Disk Drive
B6925-B5925-B1985
Burroughs B20 Memory Upgrades
B20-B21-B22-B25-B26 etc.
Depot Maintenance

Universal Financial
375 W. 1st St., Elmhurst, IL 60126
1-800-558-5858 (312) 279-1180

BIDS & PROPOSALS

IF YOU'RE BUYING, WE'RE SELLING. IF YOU'RE SELLING, WE'RE BUYING.

36 38 4300

IBM SYSTEMS Buy • Sell • Lease PERIPHERALS

(800) 331-8283 TOLL FREE **(213) 306-9343** CALIFORNIA

Ocean Computers, Inc.
8055 W. Manchester Ave., Ste 525,
Playa Del Rey, CA 90293

CDLA

MASSCOMP Computer Sale

50-60% Off List

35 New And Used MC 68010 And MC 68020 Based 32-Bit Unix Computers, Masscomp Models 5400 And 5500, For Sale By System Integrator As Excess Inventory.

Contact A. Santucci,
(203) 282-1478

REQUEST FOR PROPOSAL (RFP)

The City of New York Department of Environmental Protection is soliciting proposals from qualified Vendors to expand and upgrade its mini-based **AEC/CADD** system (Architectural/Engineering/ Construction Design and Drafting).

RFP is divided into seven classes:

A - CADD Software (Mini only)
B - Mini CPU and S/W, H/W
C - Design Workstations
D - Plotters
E - Hard Copy Units
F - Communications Equipment
G - System Integration Svcs.

Interested parties should phone Joel Thaler at (212) 566-1718. Copies of RFP available at 40 Worth Street, Room 1205, N.Y., N.Y. 10013.

Non-mandatory pre-proposal conference will be held at above location on June 5, 1987, at 10 A.M. Vendors should reserve with Mr. Thaler at above phone number.

STATE OF CONNECTICUT
D.A.S. BUREAU OF PURCHASES
REQUEST FOR PROPOSAL (R715)

Vendors interested in responding to a forthcoming RFP for the implementation of an automated Food Management System, including menus, forecasting, nutritional analysis and patient tray cards are asked to contact:

Resources & Facilities Planning
340 Capitol Avenue, 1st Floor
Hartford, CT 06106
(203) 566-3304

JOHN W. OTTERBEIN
DEPUTY COMMISSIONER

REQUEST FOR PROPOSALS

The Broward County Sheriff's Office, Broward County, Florida is soliciting proposals to computerize three currently manual operations - Commissary Order Processing, Cash Bonds Accounting and Civil Division. RFP's to be released on or about May 22, 1987. For further information, contact:

Mr. Harold Askew, Internal Auditor
Broward County Sheriff's Office
P.O. Box 9507
Fort Lauderdale, Florida 33310
Telephone: (305) 765-8900 Ext. 425

To be placed on the vendor's list, all requests must be submitted in writing on company letterhead to:

Mrs. Donna Council, Purchasing Agent
Broward County Sheriff's Office
P.O. Box 9507
Fort Lauderdale, Florida 33310
Telephone: (305) 765-8900 Ext. 268

Buy Sell Lease

SERIES/1
SAVE ON NEW OR USED

S/38
4361
4341
ALL RELATED PERIPHERALS

S/34
ALL UPGRADES AVAILABLE

S/36
SHORT-LONG TERM LEASES

612-941-1099 800-328-4358

COMPUTER OPTIONS, INC.
The Best Option

SOUTHERN DATA SYSTEMS
2712 Landers Ave. Nashville, TN 37211
(615) 244-3012

where quality service is a classical tradition

SYSTEM 34 36 38
All Related I/O

MAINFRAME I/O
Terminals Printers
DASD Controllers

S/23 DATAMASTER
PC/XT/AT 5110/5120
DISPLAYWRITER

(Call Us Toll Free, Today!)
800-251-2614

IBM HARDWARE
BUY • SELL • LEASE

SERIES-1
S/34 • S/36
S/23 • POS

AMCOM CORPORATION
5555 WEST 78TH STREET
MINNEAPOLIS, MN 55435
612-829-7445 800-328-7723

HONEYWELL

LEVEL 6 • DPS 6 SERIES 16

- Complete Minicomputer Line - New & Used
- All Peripherals and Terminals
- Upgrades and Features
- Depot Repair Capability
- Honeywell Maintenance Guaranteed
- Immediate Delivery Low Prices

• NEW PRODUCT •
Full Line of
AT and XT Compatible PC'S

The Recognized Leader in Honeywell Minicomputer Sales and Support

BCS
BOSTON COMPUTER SERVICES

100 Bearfoot Rd Northboro MA 01532
617 393-6839 TWX 710 347 7574

*** D E C**

BUY · SELL
TRADE · LEASE
NEW/USED
SYSTEMS PERIPHERALS

Time Electronics, Inc.
MA: 617-342-4210
OH: 614-764-2224

* DEC is a Registered Trademark of Digital Equipment Corp.

Researching all your options will show you that your best source is COMPUTERWORLD

THE BULLETIN BOARD

MISC. SYSTEMS

Special - 9766's
CDC 300Mb Disk Drives
Refurbished
30 Day Warranty
Compatible With All Systems
$3,995. To $4,995.
Galaxy Computers
Buy Sell
(612) 944-3060

SALE
NIXDORF System 600/45
DPEXI (2) 66 mb disk
Terminals & Printers
Immediate Delivery
Price Open
Call Mr. White
(404) 872-4765

MODEMS

Available Immediately,
For Sale Or Lease.
(4) **Paradyne DCX 861**
and
(2) **Paradyne DCX 871**
Multiplexors.
Call Carrol Of **C.S.U. Industries**
At **(516) 239-4310**

DEC

BUY • SELL • TRADE
Planning to buy non-DEC memory? Check our DEC memory prices first!

1184-AA	LA180-EA	MS750-HB
DZQ11-M	MS86-CA	MS780-JA
HSC5X-BA	MS630-CA	MSV11-JC
KDF11-BE	MS750-CA	RL02-AK

NEW YORK COMPUTER EXCHANGE
(516)752-8666 (800)645-9109

PRIME

LARGE SELECTION OF USED PRIME COMPUTER SYSTEMS
...SAVINGS TO 50%
Peripherals also available
1st SOLUTIONS, INC.
11460 N. CAVE CREEK RD.,
PHOENIX, ARIZONA 85020
(602) 997-0997
ASK FOR DON

TSI...YOUR FULL LINE VENDOR FOR ALL YOUR PRIME COMPUTER NEEDS
Buy • Sell • Lease • Rent
National 800-222-3475
Florida 800-421-4135
Northeast 800-874-3475
Timesharing Services, Inc.
4080 Woodcock Drive
Jacksonville, Fl 32207

DATA GENERAL

NPA SYSTEMS INC.
for the SALE, LEASE, PURCHASE & SERVICES OF DATA GENERAL EQUIPMENT
(516) 467-2500 (NY)
(415) 848-9835 (CA)
DISASTER PLAN & FACILITY MANAGEMENT ALSO AVAILABLE
* We'll Pay Top $ For MV Systems *

SPERRY UNIVAC

Sperry System 80
Full Compliment Of Peripherals
System Is Available In July
For More Information Please Contact
Frank Fiammetta **(415) 330-4127**
VWR Scientific, PO Box 7900,
San Francisco, CA 94120

QANTEL

BUY SELL LEASE
QANTEL/NEC
CALL PROMPT COMPUTER
Dan Kobie
(216) 248-2898

HEWLETT PACKARD

S/70 & S/68
Also
HP 2392A Terminals
Qty. Available
Quantity Pricing Available
All in stock - immediate delivery
Subject to prior sale
All warranted to qualify for manufacturer's maintenance
BUY * SELL * RENT * LEASE
Processors * Peripherals * Systems
From the HP 3000 Experts!
800/643-4954 213/829-2277
ConAm Corporation
It's Performance That Counts!

HP 3000 • 1000
9000 *and now* **250**
Buy & Sell Worldwide
ENCORE
(213) 452-9117
Telex 756927

H-P Model 66 & Model 42
With 7933's, 7978, 2563A And 2934's
Available Immediately
For Sale Or Lease.
Will Sell Separately.
Guaranteed To Qualify
For Hewlett-Packard Maintenance.
Call Carrol Of **C.S.U. Industries**
At **(516) 239-4310**

MISC.

NEW & USED RAISED FLOORING
Immediate Delivery
Quality Installation
RAISED COMPUTER FLOORS
One Charles Street
Westwood, NJ 07675
(201) 666-8200
Telex #13-5076

IBM

WANTED
3430-A1
Call Bill Hegan
(914) 238-9631
Computer Merchants Inc.

S/36 S/38
Buy - Sell - Lease
We Pay Cash
for your used equipment
1-800-LEAS-PAK
In Texas: 1-800-722-7811
D/FW Metro: 267-2841

For Sale
IBM 36 400 Megabyte, 400 K
IBM Printer 5262 Model 001
600 Lines Per Minute
(5) **5251 IBM CRTs**
Best Offer
Contact Roger Michel
(301) 646-2121

S/34 . S/36 . S/38
Upgrades/Peripherals
Lowest Price
Call Collect **(404) 475-7507**
Datamarc Computer Sales
785 Branch Dr, Alpharetta, GA 30201

SALE OR LEASE
S/38
Model 6G1
Available Now
Call Ron Gibb (914) 238-9631
Computer Merchants Inc.

PRINT TRAINS
IBM 1416 & 3216
Bought - Sold - Lease
Repaired - Reconditioned
COMPU-ACT COMPANY, INC.
(513) 863-2461

3180
3178, 3179,
3278, 3274
All Other IBM Units Available
Call Penny 800/426-4341
In CA 408/241-3677
Marketex Computer Corp.

BUY • SELL • SAVE $
IBM DISPLAYWRITERS
34'S, 36'S, 38'S
5525 Systems
5219 Printers, 5253-1 Terminals
LRK RESOURCES UNLTD INC.
CALL LAURIE OR RICK
713-437-7379

S/38 S/36 S/34
SERIES 1
BUY - SELL - LEASE
Systems, Peripherals & Upgrades
Source Data Products Inc.
800 Menlo Avenue # 200
Menlo Park, CA 94025
800/328-2669 415/326-7333

SALE OR LEASE
3196s 3197s
New
3-Year Warranty
Call Louis Felder (914) 238-9631
Computer Merchants Inc.

BUY/SELL
IBM
3725 . 3720
3705
DISTINCTIVE DATAPROCESSING
CALL 214/869-2214

SYSTEM/36 B23
* 256K Memory
* Workstation Expansion
* Single Line Communications
* (2) #5291 Workstations
Phone (312) 399-7321

4381P03
Lease Or Sale
Model 14 And Memory
Upgrades Available
Entrepo Financial Resources
(215) 886-2300

9370's For Lease
Available September
3279-S3G's
Sell/Lease
Bluebonnet Computer Co.
(512) 926-3900

WANG

HOLSON ASSOCIATES, INC.
Buy And Sell
Guaranteed
For Wang Maintenance
2470 Windy Hill Road, Suite 253
Marietta, GA 30067
Call: Richard Holley or Carole Benson
(404) 980-1700

BUY - SELL
MVP/LVP • OIS • VS • PC
SYSTEMS IN INVENTORY
VS-45 • OIS • VS-100
GENESIS
EQUIPMENT MARKETING
GEM
(602) 277-8230

SAVE UP TO 50%
ON WANG REMANUFACTURED
OIS • VS • PC's • WPS
Free Installation
Guaranteed for the
Wang Service Contract
Word Processing Brokerage Corp.
Authorized Wang
Remanufactured Equipment Dealer
800/223-9264 IN PA **215/683-6883**

TIME, SERVICES & SOFTWARE

THE CLOCK IS TICKING...

Do you have time available on a computer? Or are you offering a special service? Then tell people about it with an ad in the **Time & Services** section of Computerworld's classified pages.

Every week, we'll deliver your sales message to more than 600,000 computer-involved professionals. The very people who are interested in what you have to offer.

And independent research by STAT Resources of Boston discovered that fully 61% of our subscribers plan to purchase outside services this year.

Place your ads today. Simply call toll-free at (800) 343-6474. In Massachusetts, call (617) 879-0700.

DEC SPECIALISTS

VAX 8600 & PDP-11
TIME SHARING
NO CPU CHARGES
$7/$10
RSTS/E VMS
PER HOUR CONNECT TIME
BUDGET BYTES®
212-944-9230
EXT. 110

[ ] TIMESHARING
[ ] GENERAL CONSULTING
[ ] SOFTWARE DEVELOPMENT
[ ] FACILITIES MANAGEMENT
[ ] COMPUTER EQUIPMENT & SUPPLIES
[ ] HARDWARE MAINTENANCE (NY METRO AREA)
[ ] MEDIA CONVERSION
[ ] EXECUTIVE SEARCH
[ ] SOLOMON ACCOUNTING SOFTWARE

Omnicomputer, Inc.®
1440 Broadway, New York, N.Y. 10018

VAX TIME

- 8600, 785 and 780 Computers
- Rates from $5.00/Hour
- Timeshared or Dedicated
- Tymnet Access Available
- Hotsite Backup Services

AMERICAN DIVERSIFIED
Costa Mesa, California
CONTACT: KEN CHARLTON
(800) 426-5890 Outside Calif.
(800) 345-2265 Calif. Only

COMPUTING SERVICES

CPU 1	CPU 2
MVS/XA	VM/370
CICS	DOS/VSE
IMS	CICS
TSO	CMS

** IBM HARDWARE
** FULL TECHNICAL SUPPORT
** FOURTH GENERATION LANGUAGES
** NATIONWIDE ACCESS
** GUARANTEED RESPONSE AND AVAILABILITY
** FULL DISASTER RECOVERY BACKUP
** ON-SITE CUSTOMER AREA
** FULL SECURITY
** VOLUME AND TERM DISCOUNTS

For more information please contact
BURNS COMPUTING SERVICES, INC.
10 Gould Center
Rolling Meadows, IL 60008
Midwestern Sales (312) 981-5260
Eastern Sales (212) 432-1151 • (215) 398-3600

INCOTECH

Innovative Computer Techniques
COMPUTER SERVICES
IBM 3081 DEC-10
VAX 8600
• Batch Processing • Public Network Access
• Timesharing • Laser Printing
Route 202, Raritan, N.J. 08869
201-526-3400. Contact: Joyce Bogenske

Why Pay More?

Take advantage of the latest hardware and software tools at our world class data center.

Realize immediate cost saving benefits by processing at our shared resource facility on IBM 3081 and 3090 computers in an MVS/XA environment.

- Full CICS, IMS, DB2 Services
- Service Level Guarantees
- Extensive Network Capabilities
- Client Help Desk Facility

Get The Facts—FREE!
Call Toll Free 800-225-7135
In Colorado (303) 430-8881

Security Pacific Information Systems, Inc.
1401 Del Norte Street
Denver, Colorado 80221

Rent Terminals or Time in the Classified Pages of Computerworld.

How to increase your power without paying the price.

Turn to Manufacturers Hanover Data Services Corporation for low-cost, state-of-the-art timesharing and Information Center services.

- Secure environment
- Software includes MVS/SP, VM/SP, VM/XA, TSO, GDDM, CMS, and Presentation Graphics Equipment
- Processing done on IBM 3084 MX3 and IBM 4381 systems
- Accessible via many telecommunications methods
- Volume discounts

For more information write:
Jeff Daum
Manufacturers Hanover Data Services Corporation
P.O. Box 26
Carlstadt, New Jersey 07072
Or call (201) 896-2030

MANUFACTURERS HANOVER

IBM is a trademark of International Business Machines Corporation.
© 1987 Manufacturers Hanover Trust

COMPUTERWORLD

SALES OFFICES

Publisher/President/Lee Vidmer

Vice President/Sales/Edward P. Marecki, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (617) 879-0700

BOSTON SALES OFFICE Northern Regional Manager/Michael F. Kelleher, **District Managers**/David Peterson, Bill Cadigan, Sherry Driscoll, **Account Manager**/John Watts, **Sales Assistant**/Alice Longley, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

CHICAGO SALES OFFICE Midwest Regional Manager/Russ Gerches, **District Managers**/Kevin McPherson, Larry Craven, **Sales Assistant**/Kathy Sullivant, **COMPUTERWORLD**, 2600 South River Road, Suite 304, Des Plaines, IL 60018 (312) 827-4433

NEW YORK SALES OFFICE Eastern Regional Director/Michael J. Masters, **Senior District Manager**/Doug Cheney, **District Managers**/Fred Lo Sapio, Frank Genovese, **Account Manager**/Paula Smith, **Sales Assistants**/Mary Tagliareni, Sue Larson, **COMPUTERWORLD**, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

LOS ANGELES SALES OFFICE Western Regional Director/William J. Healey, **District Manager**/Carolyn Knox, **COMPUTERWORLD**, 18004 Sky Park Circle, Suite 255, Irvine, CA 92714 (714) 261-1230

SAN FRANCISCO SALES OFFICE Western Regional Director/William J. Healey, **Senior District Manager**/Barry Milione, **District Managers**/Ernie Chamberlain, Mark V. Glasner, Stevan Phillips, **Account Manager**/Alicia Hodge, **COMPUTERWORLD**, 300 Broadway, Suite 20, San Francisco, CA 94133 (415) 421-7330

ATLANTA SALES OFFICE Eastern Regional Director/Michael J. Masters, **District Manager**/Jeffrey Melnick, **Sales Assistant**/Melissa Christie, **COMPUTERWORLD**, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758

DALLAS SALES OFFICE Midwest Regional Manager/Russ Gerches, **District Manager**/Kevin C. Harold, **COMPUTERWORLD**, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0882

WASHINGTON D.C. SALES OFFICE Eastern Regional Director/Michael J. Masters, **District Manager**/Bernie Hockswender, **COMPUTERWORLD**, 3022 Javier Road, #210, Fairfax, VA 22031 (703) 280-2027

PRODUCT CLASSIFIED ADVERTISING Product Classified Advertising/Account Manager Peter Slingluff, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

RECRUITMENT ADVERTISING National Recruitment Sales Director/John Corrigan, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

RECRUITMENT ADVERTISING SALES OFFICES
New England Recruitment Manager/Al DeMille
375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

New York Recruitment Manager/Warren Kolber
Paramus Plaza 1, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

Midwest
2600 S. River Road, Suite 304, Des Plaines, IL 60018 (312) 827-4433

Western Recruitment Manager/Barbara Murphy
18004 Skypark Cicrle, Suite 100, Irvine, CA 92714 (714) 250-0164

Mid-Atlantic Recruitment Manager/Kathryn Kress
3110 Fairview Park Drive, Suite 1040, Falls Church, VA 22042 (703) 876-5100

RECRUITMENT TELEMARKETING ACCOUNT EXECUTIVES
New England, New York/Jay Novack, **Mid-Atlantic**/Pauline Smith
Midwest/Ellen Casey, **Western**/Nancy Percival
Toll Free: 1-800-343-6474 or (617) 879-0700

FOREIGN EDITORIAL/SALES OFFICES

Argentina: Ruben Argento, CW Communications S/A, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: (011) 54 134-5583. Telex: (390) 22644 (BAZAN AR).

Asia: Euan Barty, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (011) 852 5 861 3238. Telex: (780) 72827 (COMWOR HX).

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (011) 61 2 4395133. Telex: (790) AA74752 (COMWOR).

Austria: Manfred Weiss, CW Publikationen Vetagsgesellschaft m.b.H., Josefstadter Strasse 74, A-1080 Wien, Austria. Phone: (011) 43 222486 5910. Telex: (847) 115 542 (SCH/A).

Brazil: Ney Kruel, Computerworld do Brazil, Rua Alcindo Guanabara, 25-11 andar, 20.031 Rio de Janeiro, RJ Brazil. Phone: (011) 55 21 240 8225. Telex: (391) 21 30838.

Denmark: Preben Engell, Computerworld Danmark A/S, Torvegade 52, 1400 Copenhagen K, Denmark. Phone: (011) 45 1955 695. Telex: (855) 31566.

France: Jean-Louis Rendon, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, France. Phone: (011) 33 14 747 1272. Telex: (842) 613234 F.

Hungary: Dezso Futasz, Computerworld Informatika Co., Ltd. H-1536 Budapest, Pf. 386, Hungary. Phone: (011) 36 1 228 458. Telex: (861) 22 6307 (KSHP H).

Italy: Dr. Bruno Fazzini, Computer Publishing Group S.R.L., Via Vida 7, 20127 Milano, Italy. Phone: (011) 39 02 2613432. Telex: (843) 335318.

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (011) 81 3 551 3882. Telex: (781) 252-4217 (Computerworld Japan only).

Steven Yamada, Tokyo Representative Corp., Sanshin Kogyo Jimbocho 3F, Chiyoda-ku, Tokyo 101, Japan. Phone: (011) 81 3 230-4117/4118. Telex: (781) J26860 (reps for all CWCI publications except Computerworld Japan).

Mexico: Henry Morales, Computer Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma, 06700 Mexico. Phone: (905) 514-4218 or 6309. Telex: (383) 177 1300 (ACHAME).

The Netherlands: Wout Berends, CW Communications B.V., van Eeghenstraat 84, 1071 GK Amsterdam, The Netherlands. Phone: (011) 31 20 646426. Telex: (844) 18242 (CWCOM NL).

New Zealand: Reg Birchfield, CW Communications Ltd., 13 Maidstone St., Grey Inn, Auckland 1, New Zealand. Phone: (011) 64 9 768 993. Fax: (011) 64 9 780 244.

Norway: Morten Hansen, CW Norge A/S, Hovinveien 43, P.O. Box 2862, Toyen, 0608 Oslo 6, Norway. Phone: (011) 472 647725. Telex: (856) 76476 (CW NOR N).

People's Republic of China: Chen Mingkun, China Computerworld, 74 Lu Gu Road, Box 750, Beijing 100039, People's Republic of China. Phone: (011) 47 814 6174. Telex: (716) 222214 (CCW CN).

Spain: Francisco Zabala, Computerworld Espana, Rafael Calvo 18 4B, 28010 Madrid, Spain. Phone: (011) 34 1 419 4014. Telex: (831) 47894 (CW E).

Sweden: Bengt Mamfeldt, CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: (011) 46 8 67 91 80. Telex: (854) 14904 9 (NOVACW).

Switzerland: Gebhard Osterwalder, CW Publikationen AG, Witikonerstrasse no. 15, Postfach 253, CH - 8030 Zurich, Switzerland. Phone: (011) 41 1 55 10 77. Telex: (845) 816 710.

Taiwan: Leona Wang, ACE Media Agency Co. Ltd., P.O. Box 26-578 Taipei, Taiwan, R.O.C. Phone: (011) 02 751 3636. Telex: (785) 14142 (ACE GROUP). (Representative for all CWCI publications).

London: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WCI 8UT, United Kingdom. Phone: (011) 44 1 831 9252. Telex: (851) 262346.

United Kingdom: Euan Rose, Beere Hobson & Associates, 34 Warwick Road, Kenilworth, Warwickshire, CV8 1HE, United Kingdom. Phone: (011) 09 26 512424. Telex: (851) 311951 (BEEHOB). (Representative for all CWCI publications).

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.R.L. Torre Maracaibo, Piso 13, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: (011) 58 2 72 76 30.

West Germany: Eckhard Utpadel, CW Publikationen Vertagsgesellschaft mbH, Rheinstrasse 26/28, Postfach 40 0429, 8000 Munchen 40, West Germany. Phone: (011) 49 89 360860. Telex: (841) 5215350. (COMW D).

CW COMMUNICATIONS/INC.

Patrick J. McGovern
Board Chairman

Axel Leblois, **Chief Executive Officer, CWCI, Inc.** — Lee Vidmer, **President, CWCI/Framingham**

Vice President/Sales. Edward P. Marecki. **Vice President/Finance.** William P. Murphy.

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: (617) 879-0700. Telex: 95-1153. FAX: (617) 875-8931

SALES **Vice President/Display Sales.** Edward P. Marecki. **National Recruitment Sales Director.** John Corrigan. **Display Sales Operations Manager.** Carolyn Novack. **Display Advertising Production Manager.** Maureen Carter. **Classified Operations Manager.** Cynthia Delany.

MARKETING **Director of Marketing.** Bob Singer. **Marketing Services Manager.** Audrey Shohan

COMMUNICATION SERVICES **Vice President/Research.** Jack Edmonston. **Director Research.** Kathryn Dinneen. **Sales Promotion Director.** Liz Johnson.

PRODUCTION **Production Director.** Peter Holm. **Senior Production Manager.** Leigh Swearingen. **Typesetting Manager.** Carol Polack. **Art Director.** Tom Monahan.

CIRCULATION **Circulation Director.** Nancy L. Memtt.

ADVERTISERS INDEX

Adcom 52
Adobe Systems 68
ADR 3,58
Artificial Intelligence 27
AT&T 54,90-91

Beta Systems Software 53
Brookvale Associates 92
Business Software Tech 65

Chicago Software 92
Cincom 46
Codex 44
Compaq Computer Corp. 42-43
Computer Associates 29
Computer Consulting Center 37
Computer Management 99
Comshare 41
Concurrent Computer 80
CW Circulation 88
CW Corporate 83
CW Germany 64
CW Spotlight 93
Cyberex 92

Data Access 69
Data Design Asc. 24
Data General Corp. 15
Diconix 97
Digital Equipment Corp. 30-31
Diversified Programming Svc. Inc. 92
Duquesne 64

Execucom 50

Fibronics 12
Flaggstaff Engineering 73
Fujitsu 76-77

GE/RCA 86
Goal Systems 10

Help/38 Systems 83
Hewlett Packard 23,51
H&M Systems 119
Honeywell Bull 60-61
Hughes Aircraft 67

IBM Corp. 49
IDG Corporation 100-101
Innovation Data Processing 7
Infodata 56-57
Informix Software Inc. 25
Intecom 22
Interface Systems 35
ITT Information Systems 47

JDS Microprocessing 33
Joiner Associates 75

Language Processors Inc. 94
Lawson Associates 82
Liebert Corp. 36-37

McCormack & Dodge 120
Micom Systems 28
Mitron Systems Corp. 18
MTI Systems 32

National Advvanced Systems 55
Netec Corp. 87
North Ridge Software 39

Oracle Corporation 9

Peat Marwick 70
Persoft 14
Psychmetric 94

Radio Shack 19
Realia 74
Retrieval Technology 13
Robert Half 99

SAS Institute 16-17,45
Software AG 26
Software House 72
Software Technology & Research (STAR) 40
Symbolics 84-85
Syncsort 5

Tandon 66
Teknowledge 11
Televideo 38,78-79
TLM, Inc. 73
Travtech 87

Unisys 63

VM Software 34
VM/CMS Unlimited, Inc. 48

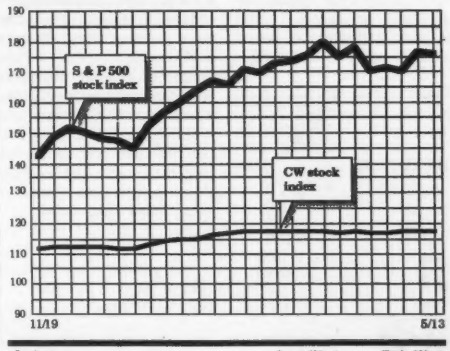
Wyse 52/53
X-Tended 96

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

UPCOMING COMPUTERWORLD SPOTLIGHT SECTIONS

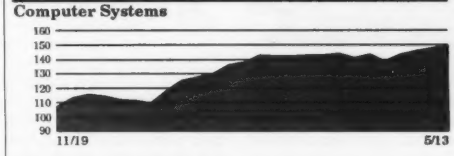
Issue Date	Topic	Ad Closing Date
June 8	LANs	May 22
June 22	Printers — Line & Character	June 5
June 29	Accounting Software	June 12
July 6	Manufacturing Technology	June 19
July 20	Accounting & Financial Software	July 3
August 3	Communications Software	July 17
August 17	DBMS	July 31

STOCK TRADING INDEX

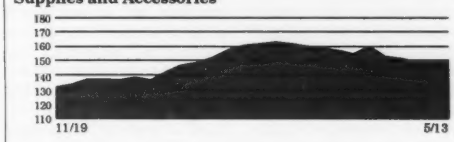


Indexes	*Last Week*	*This Week*
Computer Systems	147.8	**149.2**
Supplies & Accessories	149.8	**150.6**
Software & DP Services	132.5	**134.1**
Semiconductors	123.5	**121.5**
Peripherals & Subsystems	130.2	**132.4**
Leasing Companies	118.8	**119.8**
Composite Index	117.5	**117.6**
S&P 500 Index	176.7	**175.8**

Computer Systems

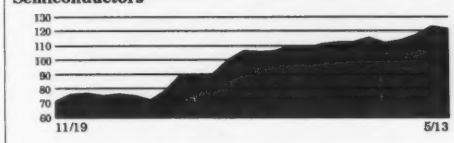


Supplies and Accessories

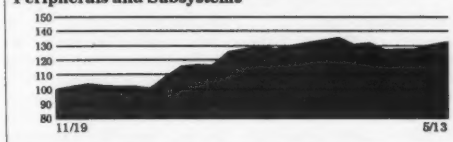


Software and DP Services

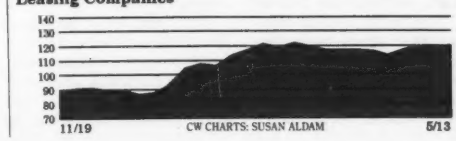
Semiconductors



Peripherals and Subsystems



Leasing Companies



CW CHARTS: SUSAN ALDAM

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MAY 13, 1987

O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

EXCH		52-WEEK RANGE (1)		CLOSE MAY 13 1987	WEEK NET CHNGE	WEEK PCT CHNGE
	Computer Systems					
O	ALPHA MICROSYSTEMS	7	4	4.38	-0.2	-4.1
O	ALTOS COMPUTER SYS	19	10	12.63	+0.3	+2.0
A	AMDAHL CORP	42	15	40.50	-0.8	-1.8
O	APOLLO COMPUTER INC	24	9	23.38	-0.3	-1.1
O	APPLE COMPUTER INC	82	30	78.50	-1.5	-1.9
N	AT&T	28	22	26.13	+1.1	+4.5
O	C P T CORP	6	3	3.75	+0.0	+0.0
N	COMPAQ COMPUTER CORP	51	12	47.63	+9.3	+24.1
A	SYMPUTER CONSOLES INC	12	7	10.38	+0.9	+9.2
O	CONCURRENT COMP CORP	19	11	18.50	+3.3	+21.3
N	CONTROL DATA CORP	35	20	33.50	+0.0	+0.0
O	CONVERGENT TECH	12	4	6.00	-0.4	-5.9
N	CRAY RESH INC	136	69	114.50	-1.8	-1.5
O	DAISY SYS CORP	14	8	9.25	+0.1	+1.4
N	DATA GEN CORP	42	25	32.50	+1.0	+3.2
N	DATAPOINT CORP	9	4	5.13	+0.3	+5.1
N	DIGITAL EQUIP CORP	175	81	166.25	-5.6	-3.3
N	FLOATING POINT SYS INC	40	11	11.50	-0.4	-3.2
N	GOULD INC	28	15	17.75	+0.9	+5.2
N	HARRIS CORP	43	27	41.63	+1.5	+3.7
N	HEWLETT PACKARD CO	63	36	63.25	+3.1	+5.2
N	HONEYWELL INC	84	58	78.88	-0.8	-0.9
N	IBM	168	116	166.25	-0.5	-0.3
O	IPL SYS INC	4	2	3.00	-0.1	-4.0
N	ITT CORP	66	44	54.13	-2.5	-4.4
N	M A COM INC	18	12	14.13	-0.4	-2.6
N	MATSUSHITA ELEC INDL LTD	136	77	120.50	+6.6	+5.8
O	MENTOR GRAPHICS CORP	34	11	31.50	-1.3	-3.8
N	NBI INC	14	8	10.88	+0.0	+0.0
N	NCR CORP	77	42	75.50	-0.3	-0.3
N	PRIME COMPUTER INC	30	16	28.13	-0.3	-0.9
O	STRATUS COMPUTER	41	18	39.50	+3.3	+9.0
O	SYMBOLICS INC	14	4	4.25	-0.1	-2.9
O	TANDEM COMPUTERS INC	75	28	73.75	+0.0	+0.0
N	TANDY CORP	56	31	40.38	-1.1	-2.7
N	TEXAS INSTRS INC	203	103	185.50	-4.0	-2.1
A	ULTIMATE CORP	35	13	23.88	-0.8	-3.0
N	UNISYS CORP	125	58	117.75	-3.8	-3.1
A	WANG LABS INC - B	19	11	18.38	-0.6	-3.3
A	WANG LABS INC - C	19	11	18.13	-0.5	-2.7
N	XEROX CORP	81	49	79.13	-0.5	-0.6
	Supplies & Accessories					
N	AMER BUSINESS PRODS	34	23	28.88	+0.3	+0.9
N	BARRY WRIGHT CORP	24	14	19.25	+1.3	+6.9
A	DUPLEX PRODS INC	23	18	19.13	-0.4	-1.9
N	ENNIS BUSINESS FORMS INC	23	14	19.63	-0.1	-0.6
N	3M CO	140	98	129.75	-1.0	-0.8
N	MOORE LTD	27	20	24.63	+0.5	+2.1
O	STANDARD REGISTER CO	53	32	44.00	-1.0	-2.2
N	WALLACE COMPUTER SVCS	50	37	44.63	+0.0	+0.0
	Software & DP Services					
O	ADVANCED COMP TECH	7	3	4.50	-0.1	-2.7
N	ADVANCED SYS INC	22	12	19.38	+0.8	+4.0
N	AGS COMPUTERS INC	45	17	42.75	-1.0	-2.3
O	AMERICAN MGMT SYS INC	38	13	37.25	+1.8	+4.9
O	AMERICAN SOFTWARE INC	22	7	18.25	-0.3	-1.4
N	ANACOMP INC	9	3	8.75	+0.1	+1.4
O	ANALYSTS INTL CORP	11	4	9.75	-0.3	-2.5
O	ASHTON TATE	30	10	27.75	+2.8	+11.0
O	ASK COMPUTER SYS INC	17	9	13.50	-0.5	-3.6
O	ASTRADYNE COMP IND	3	1	1.31	+0.0	-2.3
N	AUTOMATIC DATA PROC	51	29	45.88	-1.1	-2.4
O	BOOLE & BABBAGE INC	11	4	9.00	+0.0	+0.0
N	COMPUTER ASSOC INTL INC	27	10	26.50	-22.4	-45.8
O	COMPUTER HORIZONS CORP	15	10	13.13	-0.1	-0.9
O	COMPUTER NETWORK TECH	10	4	5.44	+0.3	+6.1
N	COMPUTER SCIENCES CORP	61	30	53.25	-2.4	-4.3
N	COMPUTER TASK GROUP INC	19	11	16.25	+1.1	+7.4
O	COMSHARE INC	18	11	16.75	-0.3	-1.5
N	CULLINET SOFTWARE INC	16	6	10.50	-0.5	-4.5
O	CYCARE SYS INC	17	7	8.00	-0.1	-1.5
O	DUQUESNE SYS INC	33	12	28.00	-0.8	-2.6
N	GENERAL ELEC CO	113	71	104.00	-2.4	-2.2
N	GENERAL MTRS CORP (CLASS E)	50	24	43.00	-0.9	-2.0
O	HOGAN SYS INC	17	9	16.13	+0.1	+0.8
O	INFORMATION SCIENCES INC	4	1	1.13	+0.3	+28.6
O	INFOTRON SYS CORP	17	7	11.00	+0.5	+4.8
O	KEANE INC	16	5	8.88	-0.1	-1.4
N	LOGICON INC	38	22	28.50	+4.0	+16.3
O	LOTUS DEV CORP	37	9	35.25	+1.5	+4.4
O	MANAGEMENT SCI AMER	21	12	13.13	+0.3	+1.9
O	MCI COMM CORP	11	5	6.63	+0.6	+10.4
O	MICOM SYS INC	18	10	17.00	+0.0	+0.0
O	MICRO PRO INTL CORP	7	2	6.38	+0.1	+2.0
N	MICROSOFT CORP	128	26	121.75	+8.8	+7.7
N	NATIONAL DATA CORP	27	16	22.00	-0.5	-2.2
N	ON LINE SOFTWARE INT	27	10	26.50	-0.1	-0.5
O	ORACLE SYS CORP	29	7	27.25	+3.5	+14.7
N	PANSOPHIC SYS INC	23	12	22.13	+0.9	+4.1
A	POLICY MGMT SYS CORP	30	15	25.00	-0.5	-2.0
O	PROGRAMMING & SYS INC	13	8	10.25	-0.8	-6.8
O	REYNOLDS & REYNOLDS CO	42	27	35.50	+2.0	+6.0
O	SCIENTIFIC COMPUTERS INC	8	4	7.63	+0.0	+0.0
O	SEI CORP	31	15	30.75	+0.5	+1.7
O	SHARED MED SYS CORP	53	29	29.50	-0.8	-2.5
O	SOFTWARE AG SYSTEMS INC	22	10	12.13	+0.4	+3.2
O	SOFTWARE PUBG CORP	16	5	15.75	+0.6	+4.1
A	STERLING SOFTWARE INC	21	9	10.75	+1.0	+10.3
N	SUNGUARD DATA SYSTEMS	21	10	19.50	+0.3	+1.3
N	UCCEL CORP	36	18	33.63	+0.0	+0.0
N	URS CORP	21	13	17.13	-0.4	-2.1
O	VM SOFTWARE INC	45	16	32.75	+0.8	+2.3
	Semiconductors					
N	ADVANCED MICRO DEV	27	13	21.75	-0.4	-1.7
N	ANALOG DEVICES INC	24	14	22.38	-1.1	-4.8
O	ANALOGIC CORP	14	10	11.88	+0.3	+2.2
N	APPLIED MAGNETICS CORP	40	13	38.13	-0.1	-0.3
O	AVANTEK INC	20	14	14.75	-1.1	-7.1
O	HADCO CORP	7	3	6.25	+0.3	+4.2
O	INTEL CORP	48	16	44.75	-1.5	-3.2
O	MICRO MASK INC	7	2	6.75	+0.4	+5.9
N	MOTOROLA INC	64	34	61.25	+0.0	+0.0
N	NATIONAL SEMICONDUCTOR	17	8	14.75	-0.9	-5.6
N	TERADYNE INC	29	16	26.63	-2.1	-7.4
	Peripherals & Subsystems					
A	AM INTL INC	9	5	6.50	+0.0	+0.0
A	ANDERSON JACOBSON INC	4	1	1.88	+0.0	+0.0
O	AST RESH INC	23	11	19.50	+1.6	+9.1
O	AUTOTROL CORP	10	5	10.00	+0.8	+8.1
O	AVANT GARDE COMPUTING	7	3	3.88	+0.1	+3.3
N	BANCTEC INC	14	6	13.50	-0.1	-0.9
N	BOLT BERANEK & NEWMAN	60	37	46.50	+0.4	+0.8
A	CETEC CORP	8	5	5.88	+0.0	+0.0
A	COGNITRONICS CORP	5	2	4.13	+0.3	+6.5
N	COMPUGRAPHIC CORP	24	16	21.75	+0.1	+0.5
N	COMPUTERVISION CORP	23	10	18.13	-0.8	-4.0
N	CONRAC CORP	30	12	27.13	+0.1	+0.5
A	DATAPRODUCTS CORP	18	11	11.63	-0.9	-7.0
A	DATARAM CORP	17	7	7.25	-0.1	-1.7
O	DATA SWITCH CORP	8	5	7.88	+0.5	+6.8
O	DATUM INC	7	4	5.63	+0.4	+7.1
N	DECISION INDS CORP	15	7	7.88	-0.4	-4.5
O	ENDATA INC	10	5	10.13	-0.1	-1.2
O	EMC CORP	34	11	27.00	-1.8	-6.1
O	EVANS & SUTHERLAND	40	20	32.25	-0.3	-0.8
N	FLOATING POINT SYS INC	40	11	11.50	-0.4	-3.2
O	GANDALF TECHNOLOGIES	11	5	8.75	-0.3	-2.8
N	GENERAL DATACOMM IND	15	8	13.25	+1.3	+10.4
O	ICOT CORP	13	5	6.50	+0.4	+6.1
O	INFORMATION INTL INC	18	13	14.00	-0.5	-3.4
O	INTERLEAF INC	20	8	20.13	+0.4	+1.9
O	MEGADATA CORP	7	2	5.00	+0.0	+0.0
A	MSI DATA CORP	17	10	14.00	+0.1	+0.9
N	NASHUA CORP	31	21	29.00	+0.3	+0.9
O	NETWORK SYS CORP	19	9	9.00	-0.9	-8.9
N	NORTH AMERN PHILIPS CORP	46	35	41.88	+2.1	+5.3
N	NORTHERN TELECOM LTD	46	27	39.00	-1.3	-3.1
O	NOVELL INC	27	9	25.75	+0.6	+2.5
N	PARADYNE CORP	11	4	8.25	+0.9	+16.3
A	PENRIL CORP	8	4	5.25	+0.1	+2.4
N	PLESSEY PLC	41	24	38.63	+0.6	+1.6
O	PRINTRONIX INC	14	10	11.88	+0.3	+2.2
N	QMS INC	18	11	15.63	+0.4	+2.5
O	RAMTEK CORP	6	4	4.38	-0.1	-2.8
N	RECOGNITION EQUIP INC	27	10	19.63	+0.0	+0.0
O	SCAN TRON CORP	19	11	11.75	+0.5	+4.4
N	SCIENTIFIC ATLANTA INC	19	9	17.88	+0.9	+5.1
O	SEAGATE TECHNOLOGY	44	10	44.00	+7.5	+20.5
N	STORAGE TECHNOLOGY	5	2	4.25	+0.1	+3.0
O	SUN MICROSYSTEM INC	40	11	40.13	+2.5	+6.6
A	T-BAR INC	8	5	8.00	+0.0	+0.0
A	TAB PRODS CO	21	12	18.63	+0.9	+4.9
O	TANDON CORP	8	2	5.63	-0.4	-6.3
A	TEC INC	6	3	3.38	+0.1	+3.8
N	TEKTRONIX INC	43	27	34.25	-1.6	-4.9
O	TELEVIDEO SYS INC	4	2	2.88	+0.0	+0.0
N	TELEX CORP	102	52	79.50	+1.3	+1.6
N	TIMEPLEX INC	41	14	38.13	-0.5	-1.3
N	TITAN CORP	11	6	6.38	+0.0	+0.0
O	WYSE TECH	33	13	32.00	+3.4	+11.8
	Leasing Companies					
N	COMDISCO INC	33	15	32.88	+0.8	+2.3
N	CONTINENTAL INFO SYS	13	7	11.63	-1.0	-7.9
O	FINALCO GROUP INC	4	2	2.88	+0.0	+0.0
O	PHOENIX AMERN INC	8	3	5.63	+0.1	+2.3
O	SELECTERM INC	8	5	5.13	+0.4	+7.9
N	U.S. LEASING	53	38	52.38	+0.4	+0.7

EXCH: N = NEW YORK; A = AMERICAN; P = PACIFIC; B = BOSTON; L = NATIONAL; M = MIDWEST; O = OVER-THE-COUNTER; S = SPLIT

IBM out in front

Battle for lead pushes IBM to top, but DEC fights to regain position

At the height of Digital Equipment Corp.'s boom in 1986, there was much hoopla on the day that DEC's stock price surged past IBM's. As the fortunes of the two industry titans continued to head in opposite directions, the stock prices moved accordingly, and DEC remained well ahead of IBM — until last week.

Last Tuesday, IBM rode a 15-point rise in the Dow Jones industrial average to close at 165⅜, up 2⅜ points. DEC, whose stock has stalled in recent weeks, fell 1¾ points that day to close ⅛ of a point below IBM at 165¼.

By the end of trading Thursday, however, DEC had regained a slight lead, closing at 165⅝ to IBM's 165⅛. In the four trading days, IBM was up 1⅛, while DEC was down 1½.

Computer Associates International, Inc., after reporting the independent software industry's first $100 million quarter, continued to surge to new highs. Computer Associates jumped 2½ points to 26½ after announcing its financial results Wednesday, then gained another ⅞ of a point Thursday to close at 27⅜, up 3½ points for the four-day period.

CLINTON WILDER

NCC

FROM PAGE 1

• An unwieldy NCC management structure that inhibited conference organizers from responding effectively to these developments and to the explosion of interest in personal computers.

At NCC's peak in 1983, some 700 exhibitors and 97,000 attendees converged on Anaheim, Calif., for the show.

But as of May 8, only 2,877 people were registered for this year's show, which runs June 15-18 in Chicago's McCormick Place, according to a spokeswoman at Registration Control Systems in Ventura, Calif. The firm, contracted by NCC to handle registrations, was told to expect 10,000 advance registrations.

No-shows

Late registrations from the local area are not likely to reflect the serious buyers that exhibitors seek. Furthermore, at 1985's NCC in Chicago, 20,000 of the 85,000 people who registered to attend did not show up, NCC officials say.

As of April 20, only 146 exhibitors had registered for this year's show, reserving about 600 booth units, down from more than 3,600 in 1984.

Skeptical former exhibitors say they will not return unless NCC pulls a rapid turnaround from last year's disappointing attendance of 42,000 in Las Vegas, which left a bitter taste in their mouths. "There were times last year when you could roll a bowling ball down the aisle, and it wouldn't hit anybody," says David Race, an exhibit manager for Distributed Processing Technology, Inc. in Maitland, Fla.

Last year's conference generated an estimated $650,000 for the five professional associations that sponsor it, roughly one-third the take of a few years ago.

AFIPS feels effects

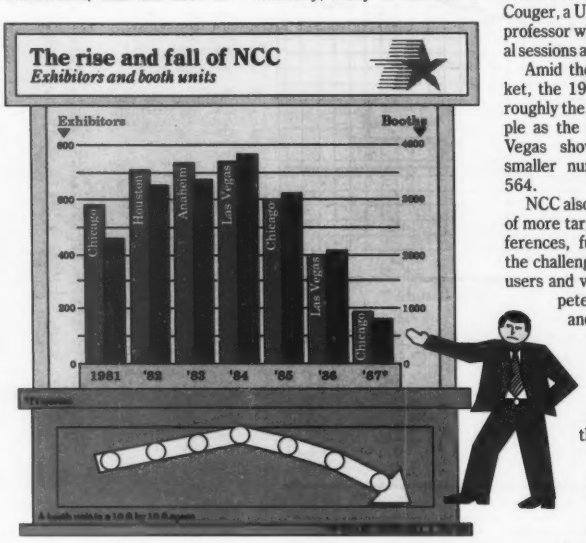
Reeling from the falloff in NCC revenue, the American Federation of Information Processing Societies (AFIPS), the umbrella organization of trade groups that owns half of the conference and manages its exhibition, laid off 15 of its 25 staff members in the past year, eliminated donations to several nonprofit groups and slashed travel expenses for volunteer NCC organizers.

Earlier this year, leaders of the Association for Computing Machinery (ACM), another of the organizations that puts together the NCC show, voted to turn over the association's 15% share of the conference to AFIPS and called the move a gift. But, with some observers wondering whether NCC may lose money this year, one of those knowledgeable about the vote likens such gift-giving to "throwing a drowning man a sack of coins."

In the past, NCC was simply *the* place for computer professionals to gather. "Back in the old days, even though the NCC wasn't targeted, you felt like you were missing the prom if you weren't there," a spokeswoman for one former exhibitor says.

But that was before the recent decline in industrywide trade shows in favor of more targeted exhibitions. "The trade has grown so big that it really doesn't make too much sense to get all the acts under one big tent," says Herbert Grosch, a former IBM and General Electric Co. executive, now retired in Switzerland, who has been involved with NCC for 18 years as a director of ACM. Grosch questions the value of attending a show as large as NCC has tried to be. "It's hard to see all your friends. The old purpose of going because everybody else is going has sort of dwindled away," he says.

NCC's rapid growth reached ridiculous proportions in 1983 at Anaheim, when temperatures climbed to more than 100 degress in six tent-like "sprung structures" set up to accommodate an overflow of exhibitors. That prompted a group of those vendors to file a suit against the conference organizers, which was later settled out of court. Ironically, many of the exhibitors who stifled in the southern California heat were microcomputer companies who later prospered but never returned to NCC.



More importantly, the size of the show eliminated the possibility of holding it in the major metropolitan areas of New York and Los Angeles. Bryan Kocher, a consultant and director of ACM, says that, at the time, he urged conference managers to limit the size of the show, perhaps by raising booth prices, so it could continue to be held in those cities rather than Las Vegas, but conference organizers resolved not to restrain its size.

Las Vegas woes

The Las Vegas location presented its own problems; most frequently cited is the lack of a large local market. In addition, "many corporations are uncomfortable signing expense vouchers for trips to Las Vegas," says former ACM secretary Kathleen Wagner, now with Wagner Law Offices Service Corp. in Madison, Wis. "I felt it was a serious mistake to move NCC as frequently as they did to Las Vegas."

Potential conference-goers apparently agreed. When NCC reached Las Vegas in 1984, there were even more exhibitors than in Anaheim — 703 — but the number of attendees plunged to 65,000. While current NCC officials emphasize the Las Vegas location as a major drawback, other shows have done well there recently; last year's Comdex/Fall drew 1,200 exhibitors and 82,000 attendees.

When NCC moved to Chicago in 1985, it ran up against the slowdown in corporate spending on computers, which forced cutbacks in vendors' exhibitions. That was accompanied by general budget tightening among user companies that made people more judicious about attending conferences, notes Daniel Couger, a University of Colorado professor who has led educational sessions at NCC for 11 years.

Amid the vast Chicago market, the 1985 conference drew roughly the same number of people as the previous year's Las Vegas show but attracted a smaller number of exhibitors, 564.

NCC also faces a proliferation of more targeted computer conferences, further compounding the challenges of cost-conscious users and vendors. It now competes for both exhibitors and attendees with shows aimed at specific functions, such as computer-aided design and manufacturing; those sponsored by individual vendors, most notably Digital Equipment Corp. and Apple Computer, Inc.; computer conferences geared toward vertical markets; and others directed toward a particular locale.

"The issues have become so much more related to software applications and making things work at individual companies that there isn't as much benefit going to a massive show aimed primarily at hardware," says James Ware, a consultant with Nolan, Norton & Co. who likens the scope of NCC to a "fire hose" of products and information.

Lured away

NEC Information Systems, Inc. in Boxboro, Mass., is a former NCC exhibitor that has been lured away by vertical-market shows. "A trade show is a substantial investment on our part," says Peter Ferguson, the company's director of marketing communications. "Upon analysis of that, we felt we weren't getting the return we thought we should get [at NCC]. . . so we thought it would be more appropriate to focus on vertical-market applications."

Unisys Corp. plans to devote 90% of its trade show efforts to vertical-market shows this year. "We did exhibit [at NCC] under the Sperry banner last year, but we opted not to this year. We've elected to identify more targeted shows for our trade show dollars this year," says Tom Grossman, manager of exhibits and special events.

John Imlay, the chairman of Management Science America, Inc. who was the keynote speaker at the 1983 NCC show, says his company exhibits at shows focused on areas such as banking

Huge shows slip toward extinction

The National Computer Conference, once the hallmark of successful computer shows, is now battling trickling interest and low attendance.

Vendors say their marketing money is better spent at shows where the attendees are members of the specific audience they want to reach. Attendees say smaller shows, geared specifically toward networking, electronic publishing, personal computers, Apple Computer, Inc. products, Digital Equipment Corp. products and the like, meet their needs more effectively than do huge, nonspecific shows.

That is not to say that generalized shows are passe; some continue to prosper. The professional management of The Interface Group, Inc. puts on a Comdex show each spring and fall for an audience of more than 40,000. The Cahners Exposition Group hosts Info, which boasts a 14-year history and draws some 40,000 to 50,000 users to New York each fall.

But, like many other once-generalized shows that followed its entrance into a wide-open market, the NCC may be headed for disaster.

A spokeswoman at the American Federation of Information Processing Societies (AFIPS), the main sponsor of the NCC show, said this year's show will go on as planned, with some 150 vendors exhibiting their wares. In better years, the show drew more than 700 exhibitors. But will the member societies of AFIPS continue to sink funds into a show that is generating little in return?

The NCC could very well plunge into obsolescence, as have so many of the products that once graced its crowded halls. And it would not be the first show to do so.

Last year, several shows quietly slipped into extinction. In March, the Office Automation Conference, also sponsored by AFIPS, met its demise. The Interface Group nixed its Comdex/Winter '86 and its Federal Data Processing & Communications Conference (canceling the latter just days before it was to take place last May). Other shows that have fallen by the wayside include Intech and Softcon.

The NCC late last month was dealt yet another blow to its trade show schedule when it was released from its partnership agreement with the North American Telecommunications Association (NATA). Together, the groups had planned to host Unicom '87 in December; NATA now says that the NCC did not meet its end of the bargain and that NATA will host the event on its own.

ALAN J. RYAN

and manufacturing. They provide a more concentrated group of potential customers than NCC, which draws a less purchase-oriented crowd that includes many academics and reporters, Imlay says.

"There's no question people still want to know what's going on in the trade, and they still want to kick the tires, but they're doing it at specialized shows," says Grosch, the veteran ACM official.

1983 NCC-goers *in Anaheim, Calif.*

The most prominent of the computer shows to spring up around NCC recently is Comdex, which has become to the burgeoning PC industry what NCC traditionally was to systems professionals. Last year's Comdex/Spring in Atlanta attracted 600 exhibitors occupying 3,000 booth units, along with 42,000 attendees. Comdex is put on twice a year by The Interface Group, Inc. in Needham, Mass.

"It appears as though the industry has voted in favor of other shows, most noticeably our Comdex show," says Sheldon Adelson, chairman of The Interface Group. "We're happy about that, but it's sad to see something that was the original show fade away because of mismanagement or failure to meet the needs of the marketplace. But the industry is maturing, and evolution is inevitable; if NCC didn't roll with the punches, it's paying the price."

John Murphy, a senior consultant with Wohl Associates in Bala Cynwyd, Pa., says NCC has been hurt by a fragmentation of the computer market led by the PC revolution. "Life has switched out of the MIS mainframe-type environment. The microcomputer has really affected the masses," he says.

A former high-ranking NCC volunteer official says the conference turned its back on microcomputers when it folded its personal computing festival in 1981, opening the door for shows geared to that audience.

"It's really ironic, because NCC was the first major show to give any recognition to the PC. In 1977, it had the first personal computing festival. In 1981, they folded it in," the official says. "From that point on, they made no effort to bring this community into the mainstream of the show; you lost a number of the movers and shakers from 1982 on up."

Management problems

Many observers, including conference officials, attribute a lack of response to such developments on the part of NCC to a bloated management structure.

NCC is organized as a partnership, with AFIPS owning 50%. Another 45% is split evenly among ACM, the Computer Society of the Institute of Electrical and Electronics Engineers and the Data Processing Management Association. The Society for Computer Simulation owns the remaining 5%.

Each year, the conference program and logistics are planned in detail by a new steering committee made up of volunteers from the sponsoring organizations who generally live in the region where the show is being held. The committee reported to the NCC Board, which is made up of leading officials of the sponsoring organizations from around the country. A staff at AFIPS markets exhibition space to vendors.

NCC '86 *floor in Las Vegas.*

After last year's show, NCC's sponsors eliminated one layer of management, a committee similar to the NCC Board that was positioned between the board and the steering committee and functioned as a "middleman, screening committee or review board," says Marty Byrne, AFIPS marketing director.

Roger Halligan, a spokesman for this year's NCC, acknowledges that while NCC organizers have developed a highly regarded educational program, they have failed to market to exhibitors or react to changing circumstances as effectively as some commercial conference management organizations that put on rival shows.

"It took a while for people on the board to react" to developments such as the growth of Comdex, says Halligan, a Chicago public relations consultant and the promotion chairman for this year's NCC.

A former high-ranking NCC volunteer says AFIPS relied on telemarketing in selling to exhibitors, rather than making personal calls. However, Byrne says AFIPS uses mailings, telemarketing and personal calls. There were additional problems with advertising agencies missing deadlines and promotional efforts running behind schedule, the former official adds.

Passing the buck

A former NCC volunteer says the show's poor management was a "pass-the-buck situation. The blame shifted from advertising agencies to the AFIPS board and others. We were never sure who was to blame."

Many small vendors, some that are exhibitors and some that are not, say the only contact they have had with NCC '87 has been through mailings of flyers and brochures.

Some NCC insiders criticize management of the show on other counts.

ACM's Kocher says AFIPS spent too much money on things such as volunteers' travel expenses. "When times were good, they put on too much fat. There was an unbelievable amount of money being spent," he says. "I think they just had too many people poking their fingers into the pie."

NCC is taking a major step to revive its marketing of exhibition space by seeking a commercial conference management company to take over that function under contract. An announcement on the selection of a company could come as early as this week, AFIPS President Jack Moshman says.

Under outside management, exhibitors will be allowed to sell their wares on the convention hall floor, which they are not now allowed to do because AFIPS is a not-for-profit organization.

NCC officials are touting another move they hope will reverse the show's decline — returning to a rotation of conferences in New York, Chicago and the Los Angeles area after this year and holding it earlier in the spring.

What is the outlook for NCC? Several computer professionals critical of the show's management say that despite its problems, its breadth makes NCC the most worthwhile conference for them to attend. But the most frequently cited gripe about NCC is its lack of focus.

AFIPS claims the show is now geared toward microcomputers, but the exhibitor list lacks names like Tandy Corp., Tandon Corp., Leading Edge Hardware Products, Inc. and Compaq Computer Corp. Peripherals for PCs will be well-represented at the show, but it is unlikely that they can lure the 30,000 to 40,000 people NCC officials say they expect.

"At this point, I think they're too far behind the eight ball," says David Conti, communications manager for Avatar Technologies, Inc. in Hopkinton, Mass. "They've come from a mainly mainframe-dominated audience and are trying to make a transition to personal computers. It's not going to happen overnight."

Other vertical shows cater to the needs of the PC industry, with stronger results at lower cost, vendors say. For users, vertical shows have the focus many are looking for and are often presented regionally.

The AFIPS team says it can turn its show around by contracting out the exhibit management to professionals. In this manner, it hopes to generate more aggressive marketing and renewed interest in the show. But an observer who works in conference management says it is too late for NCC. "The show is not looked at as a valuable property, and because of that, they will not be able to hire the best or most experienced manager," he says. For many of the NCC '87 exhibitors, this year will be a turning point. If the conference does not show greatly improved results in the generation of leads over last year, they will take their marketing dollars elsewhere.

'Has to prove itself'

"NCC will have to prove itself for us in '87," says Scott Humphrey, a spokesman for Britton Lee, Inc. in Los Gatos, Calif. "We don't mind a slightly smaller attendance if they're more qualified. That's what we need to see at NCC."

Some say they feel that NCC's traditional stature can help save it. "The show has a very strong tradition, and I think that for us as a company, it's viable. Otherwise, we wouldn't be there," says David Gould, a spokesman for Fujitsu America, Inc.

Michael Steinberg, product manager with Digital Products, Inc. in Watertown, Mass., looks to the changes afoot and the nagging issue of NCC's lack of focus in answering the question of whether it will survive. "Yes," he says, "if they do what they claim — which is put it into major markets at the right time of the year and give it a more specific orientation. Essentially, I think we'll know this year."

NCC's empty halls

Chicago's McCormick Place faces little traffic from June 15 to 18, as only 150 exhibitors are expected at NCC '87 — and a slowdown in vendor participation will likely carry with it a drop in attendance.

But also expected to suffer from lack of interest in the show is NCC's education program. Although many have forgotten this aspect of the show, it is the reason NCC got its start. Each year, a volunteer staff designs a program that covers timely issues in the market.

This year's program chairwoman, Margaret Butler, of Argonne National Laboratories' Department of Energy laboratory at the University of Chicago, said her committee has worked with the suggestions of former chairmen to come up with an informative program.

Topics to be addressed in the sessions include artificial intelligence, computer design and supercomputers, educational human resource issues, hardware directions, information technology management, microcomputers, networking and connectivity, security, privacy and law, systems software and languages and workplace applications.

All told, there will be 98 sessions involving some 400 speakers, chairmen and organizers, Butler says.

Users who opt to skip the technical sessions this year may be hard-pressed to find the leading industry vendors who had exhibited at NCC in previous years.

The few big-name vendors on the exhibitor list — IBM, AT&T, Xerox Corp. and Motorola, Inc. — stand out against a backdrop of peripheral makers, trade publications, power-supply vendors and public relations firms that constitute the majority of exhibitors.

"We don't really know what's happening with NCC. We saw a drop-off in attendance last year compared to the previous year," said Ken Patterson, producer of business shows for IBM. "This year, we're looking to Chicago to see if that will continue."

ALAN J. RYAN

IBM superconductor heats up

BY JAMES CONNOLLY
CW STAFF

YORKTOWN HEIGHTS, N.Y. — IBM continued its string of announcements heralding advances in superconductor technology last week with a report that IBM superconducting materials can carry 100 times the electrical current previously believed.

It was the third announcement in the past month from IBM's Thomas J. Watson Research Center, where IBM scientists have claimed to have overcome several key obstacles to developing computers and other products based on superconductors. Superconductor technology, which is seen as potentially useful in computers, power-transmission systems and high-speed rail lines, allows electrical currents to pass without resistance. In the case of computers, a key feature would be the ability to support high-speed switching.

An IBM spokesman said the company has made progress in overcoming several obstacles to superconductor production. The most recent announcement dealt with raising the critical current level to a point at which there is sufficient power to support practical applications. IBM claimed to have measured currents in excess of 100,000A per centimeter squared at an operating temperature of 77 degrees Kelvin.

Sub zero superconductors

In its earlier announcements, IBM claimed to have developed materials that become superconducting at 68 degrees Kelvin, which is the equivalent of 337 degrees below zero Fahrenheit. IBM said its substrates, which are combinations of yttrium, barium and copper oxides, can be cooled by liquid nitrogen at 77 degrees Kelvin rather than the liquid helium used by other researchers to cool materials to 4 degrees Kelvin.

In another announcement, IBM said it has developed a spray paint-type of technique to apply superconducting materials.

Jeffry Canin, a supercomputer analyst with the investment firm Hambrecht & Quist, Inc. in San Francisco, said that even with the recent developments, it is too early for computer vendors in the high-speed processing segment of the business to change their plans to use technologies such as chilled CMOS or gallium arsenide chips. But he said such decisions could be made during the 1990s.

Canin added that superconductors could permit development of processors with high switching speed and minimal heat dissipation.

Senior analyst Sheriden Tatsuno of Dataquest, Inc., a San Jose, Calif.-based market research firm, noted, "Right now, superconducting is one of the hottest areas for venture capitalists. There are already a couple of start-up firms, and there probably will be a dozen or so starting up this year."

Tatsuno speculated that a "start-up that is fast on its feet" could produce superconducter-based special-purpose computers within three years. But he also noted that vendors still must overcome the problem of brittleness in the materials being used and must find ways to make superconductors compatible with existing semiconductors and fabricate them at a reasonable cost.

He said the principal use of superconductors will be in alleviating performance bottlenecks in computers that use semiconductors for most processing. He said he expects cooled superconductors to be used to isolate circuits in which the bottlenecks appear.

Calcomp sells CAD unit to German distributor

BY CLINTON WILDER
CW STAFF

ANAHEIM, Calif. — Calcomp announced last week that it will sell its computer-aided design (CAD) systems business to its West German OEM distributor for an undisclosed amount of cash.

Calcomp President William P. Conlin said the firm wants to concentrate entirely on its computer graphics peripherals business, which includes plotters, digitizers and graphics displays.

The CAD systems division, which markets the Calcomp System 25 and the Cadvance microcomputer software line, accounts for less than 10% of Calcomp's revenue. The division is profitable, according to a Calcomp spokeswoman.

Calcomp found itself competing with its largest peripherals customers in the CAD systems business, Conlin said. "We found it increasingly difficult to rationalize our selling CAD systems."

Calcomp said it will continue to provide hardware maintenance on the System 25, which has an installed base of approximately 800. Software support and marketing reportedly will be taken over by the buyer, Isicad, an Ellwangen, West Germany-based company. The sale is expected to be finalized May 29.

Founded in 1985, Isicad is a System 25 OEM and also sells its own line of mechanical CAD, computer-aided manufacturing and computer-aided engineering software.

Calcomp's CAD systems division, headquartered in Anaheim, employs 90 people. No job cuts are planned, the spokeswoman said. Isicad is reportedly seeking office space in the Anaheim area to house the unit after the sale.

Calcomp is a unit of Lockheed Corp. It introduced its first CAD system in 1978 and unveiled the 32-bit Unix-based System 25 in 1984.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN-0010-4841) is published weekly, except: January (5 issues), February (5 issues), March (6 issues), April (5 issues), May (5 issues), June (6 issues), July (5 issues), August (6 issues), September (5 issues), October (5 issues), November (6 issues), December (4 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
Copyright 1987 by CW Communications/Inc. All rights reserved.
Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed: write to Circulation Dept. for subscription information.
Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970.
Permission to photocopy does not extend to contributed articles followed by this symbol. ‡
Special requests for reprints and permission should be addressed to Nancy M. Shannon, CW Communications/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Subscriptions call toll free (800) 544-3712 or (215) 768-0388 in Pennsylvania.
Subscription rates: $2.00 a copy: U.S. — $44 a year; Canada, Central & So. America — $110 a year; Europe — $165 a year; all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.

MPA ABC ABP

POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, Circulation Department, P.O. Box 1016, Southeastern, PA 19398-9984.

INSIDE LINES

No fooling around. IBM is so intent on gaining market share with its Personal System/2 that it is already underbidding compatible makers, discounting as much as 40%. A large California university was about to sign a contract to buy Zenith Data Systems' AT compatible, featuring IBM's Enhanced Graphics Adapter and 1M byte of memory, for $3,050. Along comes IBM, bidding a similar configuration of the PS/2 Model 50 for a mere $2,560. Zenith bounced back and slashed its asking price to $2,530, $30 per machine less than the IBM bid. Faced with buying old technology or spending $30 more per unit and getting IBM's latest and greatest, the university gave Zenith the Blues.

Coincidence? Intel seems to have lost several of its top microprocessor division personnel during the past six months. At least three microchip executives, several of them in marketing, have departed recently in favor of positions at other semiconductor companies in Silicon Valley. Word has it that another Intel microprocessor bigwig is currently circulating his resume. No one seems to know why, and one former Intel exec denied there was any exodus underway.

Moving on up. In an attempt to take on the Suns and Apollos of the world, Televideo Systems will today announce a line of Intel 80386-based workstations, called Telestar. The machines, which differ from one another in graphics capabilities, will run both Unix and Microsoft's MS-DOS and will come equipped with mouses. They will start at less than $9,000.

Agreeing to agree. The National Bureau of Standards' Open Systems Interconnect implementors' workshop agreed earlier this month that in order to bring stability to the ISO standard, it would cease its practice of revising the specifications each time the group meets. Workshop members plan to release a stable set of specifications in December with the understanding that updates will occur no more frequently than once per year, according to Kevin Mills, chief of NBS's systems and network architecture division.

Hot cider. Apple is currently working on a project to integrate the Mac and DEC's All-In-1 environments, confirmed Christopher Espinosa, Apple's product manager of systems software. Sources said the project is in the alpha-test stage and, so far, allows users to transfer Mac files into All-In-1.

Ring this Bell for $1,000. Hoping to move parallel programming beyond its infancy, VAX architect Gordon Bell said last week that he personally will offer two $1,000 prizes to enterprising programmers who can devise practical and elegant applications this year. Bell, the man who left DEC in 1983 to help found Encore Computer, said, "The challenge is to see how much parallelism you can get out of this new class of machines." Programmers shouldn't run to the post office just yet. The rules have yet to be written down.

Let's have lunch. Northern Telecom is expected to announce this week Meeting Communications Services, a $15,000 software package that provides voice and data conferencing across multiple Meridian Data Voice Systems that are networked over X.25 packet-switching links. In addition to teleconferencing, users on geographically separate Meridian systems can share and cooperatively change screen views on their integrated voice/data terminals, Northern Telecom said.

No sense of humor. A Minnesota laser printer remarketer last week alleged that Xerox salesmen have threatened Xerox customers with changes in maintenance agreements if they buy new or used Xerox laser printers from third-party brokers. In an antitrust suit filed in U.S. District Court in St. Paul, Amerinet charged that Xerox amended its maintenance agreement terms as of Jan. 1 as an unfair competitive weapon against the secondary market for laser printers. Amerinet's suit cites Xerox's alleged threats against several large users, including Massachusetts Mutual Life Insurance and New York Life. A Xerox spokesman said the firm had no comment as of press time.

MORE THAN JUST
THE BASIC NECESSITIES.

KEYFAST®

ONLINE · DATA · ENTRY

THE MOST INSTALLED
ONLINE DATA ENTRY
SYSTEM WORLDWIDE

Our customers have it all wrapped up. Power and performance in one complete package to suit every need. When it comes to fast data entry and processing, they know that KEYFAST will deliver. H&M's CICS data entry system provides powerful and helpful functions that allow you to paint data entry documents directly on the screen, select data entry and verify rules from menus; define your own data entry shorthand, duplicate fields and records when entering data, insert data from tables and user files, check entry data against table data, calculate totals automatically. Take advantage of the Data Dictionary and eliminate the need for user exits. Make use of The LANGUAGE, H&M's end user programming language, to define special field validations. Guarantee clean data with flexible and comprehensive checks: alphanumeric, numeric, binary, packed and entry/verify fields, range checks; search, mass change, select, merge, copy and sort functions. Ensure data integrity with KEYFAST's multilevel security. Profit from the extensive batch utilities; extract data on any storage media. Reap the benefits of easy use with menus, Help Screens and messages. Choose the best and opt for KEYFAST!

H&M.
SOFTWARE'S FUTURE

H&M Systems Software, Inc., 25 E. Spring Valley Avenue
Maywood, N.J. 07607-9982, Phone: 1-(201) 845-3357
TOLL FREE: 1-(800) FOR DEMO

KEY87-BUS

MAIL FOR MORE INFORMATION

Name

Company

Department

Phone

Street

City, State, Zip

CPU Op.System

H&M Systems Software, Inc., 25 E. Spring Valley Ave.
Maywood, N.J. 07607-9982, Phone: 1-(201) 845-3357

Photo: NASA

OUR SOFTWARE IS PREFERRED BY AN ELITE CIRCLE.

This world has many companies whose products are marketed across borders. But only one whose software crosses borders – in two important respects.

First, our technology.

Several years ago, McCormack & Dodge pioneered a technique of integration which allowed users to move effortlessly from one application to the next while pursuing a path of inquiry. In effect, this development erased the borders between packages and created a single informational environment for corporate decision-making.

Second – and even more important than our celebrated borderless technology – is the McCormack & Dodge approach to multinational service and support. Truly borderless in the classic geographic sense.

We have professionals in over 40 countries. We offer systems and documentation in multiple languages. We design our systems to accommodate the myriad laws and business practices found throughout the world. And to run in several different hardware environments.

In the world of McCormack & Dodge, knowledge has no borders.

McCormack & Dodge

a company of
The Dun & Bradstreet Corporation

Financial, human resource, manufacturing, and application development software for mainframe and minicomputer environments. Call 1-800-343-0325.

© 1987